Railway Age

AND RAILWAY REVIEW

FIRST HALF OF 1928—No. 15 APRIL 14, 1928 SEVENTY-THIRD YEAR

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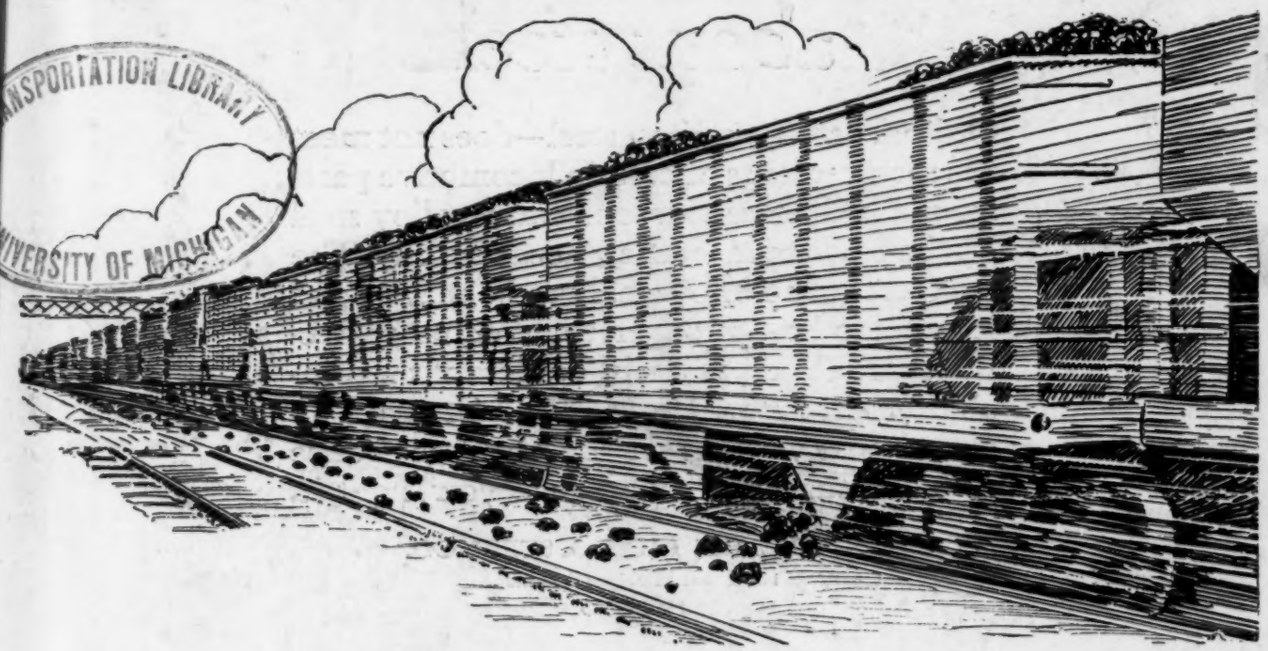

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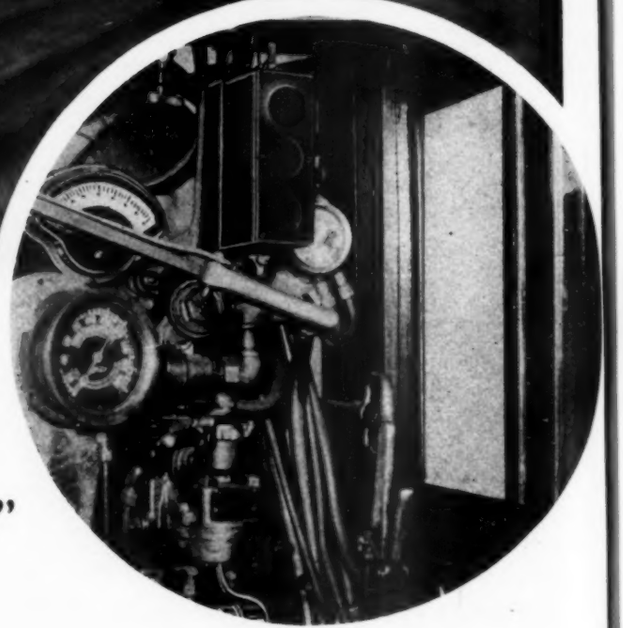

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1928

Railway Age

Vol. 84, No. 15 April 14, 1928

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Railroad Interest in Air Transport

IN the *Railway Age* of April 7 was a news item telling of another railway which has given an official expression of its interest in the possibilities of air transportation by the appointment of a special committee to keep in touch with developments along this line. In this instance, the road is the Missouri Pacific. In appointing a standing committee on aviation, it has followed the example of several other railways. Similar action will doubtless be taken by other lines in the near future. Air transportation has seized the imagination of railway men, and there is ample evidence that they are willing to make use of it in conjunction with railway operation. This seems to be an adequate answer to those who have criticised the railways on account of their conservatism toward motor coach and truck operation. It is true that a number of obstacles must be overcome before air transportation will take its place beside the railways and the highway lines as a carrier which has proved its dependability as well as its usefulness. In the meantime, however, it appears that the railways are awake to the desirability of keeping informed about the progress that the airplane lines are making, so that when the appropriate time times comes they will not fail to take advantage of the opportunity for super-fast supplementary service afforded by the airplane.

What Has Been Accomplished in Draft Gear Maintenance?

THE agitation for better draft gear protection for freight cars, implying the replacement of gears which are deficient, because of either improper design or lack of maintenance, is not new. In 1915, J. C. Fritts, at that time master car builder of the Delaware, Lackawanna & Western, said, "A very careful check of cars placed on shop tracks for repairs in several parts of the country shows that an average of 71 per cent are so placed on account of defects that have developed due to shocks, and of a lot of 1,000 cars recently transferred, it was found that over 80 per cent of the failures were also due to shocks" In the same year, F. F. Gaines, then superintendent of motive power of the Central of Georgia, said that the draft gear is the weakest part of the car and the one needing immediate attention, maintaining that an analysis of car repair bills for a period of six months showed that 38.9 per cent of the money was expended for draft gear parts and connections. The question may well be asked, What has been accomplished in the past 15 years to improve these draft gear conditions? That the problem has by no means been solved is indicated by the action of the American Railway Association, Mechanical Division, in authorizing draft gear tests at Purdue University with a view to developing a specification for draft gears which will satisfactorily meet modern operating requirements. Another hopeful sign for the final solution of the problem is the valuable work which a number of individual roads are doing in the periodical inspection and maintenance of gears on system-owned cars. It is doubtful if money can be spent on many railroads in a way which will bring relatively bigger returns.

A Surprising Increase in Capacity of Single Track

ON an 82-mile section of exceedingly busy single track through mountainous territory with numerous sharp curves around high bluffs, train movements were directed by manual block and train orders, using a permissive card for following movements of freight trains. The operating officers considered that this method of operation resulted in the greatest possible track capacity, and when the installation of automatic signals was proposed as a safety measure strenuous objections were presented. However, much to the surprise of the officers of this line, experience has shown that the train movements were speeded up and track capacity increased after the automatic signals were installed. The explanation of this increased capacity lies in the fact that with the manual block a train following another into a block was forced to run at limited speed throughout the entire block, prepared to stop at any point and watching carefully around curves for the preceding train which might be just ahead or which, on the other hand, might have passed out of the block shortly after the first train entered it. With the automatic signals, however, when the engineman of a following train gets a clear indication he knows that the preceding train is at least two blocks in advance and he, therefore, proceeds at normal rather than limited speed. As a result the average speed of all trains has been increased, which has been a surprise to many of those interested in the installation of the signals and the operation of the division.

Curtailing Losing Services an Important Railroad Task

THE task of the railroads in the period of change when the balance between railway and highway transportation is being worked out has two aspects. The first is, of course, to make sure by providing a high grade of service that no more business goes to the highway than it is economically the best fitted to handle. The second is the readjustment of railroad service to

conform to the new requirements placed upon it. The solution of the first problem involves the retention of and increase in remunerative traffic. That of the second looks to the abandonment of services no longer required and the substitution of less costly agencies of transportation for the more costly. Both problems are equally important, since both have a direct bearing on net return. Among the various steps taken to reduce services no longer required come the abandonment of non-remunerative trains and even of some light-traffic lines, the substitution of rail motor cars and motor coaches for trains which do not pay their way, and the abandonment of agency stations where traffic has all but disappeared. As an instance of how far traffic may fall off before a station is abandoned, a recent case of application for such authority may be cited where the station in question sold an average of seven tickets a day, most of them covering only a short distance, and where gross receipts from freight were only about $5 in a year. The agent at this station earned wages totaling over $1,300 in a year. Reduction in service, no matter how poorly it is patronized, generally meets with resistance. It would appear, however, that railroad officers who can effectively meet this resistance and effect constant curtailment of such expenses can probably do as much for the net revenues of a railroad as the most successful traffic solicitors. They deserve the greatest encouragement in their work.

An Indication of Progress

THE comment has been current in iron and steel circles in recent weeks to the effect that the railways have now practically completed the placing of orders for their current year's rail requirements, while their track accessories contracts are scarcely less advanced. Since this involves about three million tons of rails and more than a million tons of accessories, with an expenditure of nearly 200 million dollars, it is a buying movement of no mean magnitude.

In view of the early date of completion of this large purchasing program, it is not out of place to compare it with the practices of the past. Such a comparison shows at once a marked contrast with the conditions which prevailed for many years up to as recently as ten years ago, when practically none of the roads ordered its rails until spring and many of them delayed placing their contracts until after July 1. This delay was due to the termination of the railways' fiscal year on June 30. When the Interstate Commerce Commission changed the termination of the year to December 31 the incentive to postpone rail orders and delivery until the middle of the summer and the season's heaviest maintenance work until the fall in order to throw the charges into the next fiscal year, was removed. As a result, the roads are free to order their rail in any season that contributes most to economy of laying it. That they have taken advantage of this condition is shown by this year's activity.

This change has led to another innovation which is believed by many roads to contribute also to economy in laying rail—namely, the placing of it in the winter when other track work is of necessity at a minimum and adequate experienced forces are available. While this latter practice is not yet universal, it is widely followed and is gaining adherents yearly, as evidenced by the increasingly large proportion of the rail that is being ordered in November and December of each year for delivery in January and February.

It is only by looking backward occasionally and comparing present practices with those of the past that one can gain an accurate idea of the progress that is being made in the development of economical practices. Such retrospect shows striking changes in the handling of rail in the last decade with marked contribution to economy of operation.

The Pension Problem

THERE has been a distinct tendency in post-war years for many organizations, both industrial and otherwise, to install adequate provisions for the retirement of employees who have reached a certain age or who are for other reasons incapacitated. The first requirement in approaching this problem is to have a thorough study made under competent actuarial guidance. This essential was clearly pointed out in a report on industrial pensions which was published by the Merchants Association of New York in 1920. The invariable result of such a study is usually staggering, in that it indicates the very great expense which will be involved, since provision must be made for the establishment of a fund to cover the accrued liability which has been piling up from year to year because of the long service on the part of many of the employees. Logically, a certain amount of money should have been set aside regularly for this purpose from the time each employee first entered the service.

Not a few organizations have been discouraged from establishing pension plans, because they could not devise ways and means of setting up a sufficient fund to cover this liability; particularly since actuarial studies have shown that without such a provision the amount of money which will have to be taken from the operating revenues each year will eventually become so great as to seem almost prohibitive.

Some of the railroads established pension systems many years ago when the importance of actuarial guidance was not recognized, and most of the other railroads which have since started pension funds have copied the methods and practices followed by pioneers. As a result, in most cases, thorough actuarial studies have not been made and adequate funds have not been set up to cover the accrued liability to date; moreover, no attempt is being made in most cases to add currently to such funds on the basis of the liability which is accruing from month to month, or from year to year. It has already been pointed out in these pages that this will cause a steady increase in the demands upon the operating revenues of the future, which may reach a point that may prove embarrassing and make necessary a retrenchment in the pension plans.

The situation is all the more involved in the case of the railroads, because in its effort to protect the public by getting the government's share of any earnings in excess of six per cent, the Interstate Commerce Commission has not clearly indicated a willingness to allow contributions to the funding of pension plans to be charged to operating expenses. The successful working out of this problem means so much to the railroads and their employees, that it would seem that no effort should be spared to discover exactly what the future requirements will be on a sound actuarial basis, and then with the help of the Interstate Commerce Commission,

to find some way of solving the problem of funding the pension plans on a basis which will be equitable to all concerned, including the public.

Railway Earnings and Prospects

SOME recent railway results and business forecasts tend to cause more optimism regarding railroad total earnings and net operating income than has been felt for some time. At the end of January the Class I roads had shown a decline of net operating income for 10 consecutive months, comparison being made with the corresponding months of the year before.

In November the decline was 25 per cent and in December 30 per cent. In January, however, it was only 7 per cent, while for February the roads have reported a slight gain, the figure for February, 1927, being $69,516,412, and for February, 1928, $70,064,223. This outcome in February was in some measure due to the fact that it included an extra day. Total operating revenues, however, were 2.8 per cent less than in February, 1927. The gain in net was due principally to a small decrease in taxes and a reduction of 3.7 per cent in the operating expenses.

Immediately on the heels of the comparatively favorable report of railway financial results in February came the joint forecast of the Regional Shippers' Advisory Board, as compiled by the Car Service Division of the American Railway Association, regarding probable freight car requirements in the second quarter of 1928. This presages an increase in April, May and June of 3.7 per cent in shippers' total demand for cars, as compared with their demands in the second quarter of 1927. Only the Trans-Missouri-Kansas, the Pacific Coast, the Ohio Valley and the New England boards anticipate a reduction in the demands for freight cars in their territories, while the other nine boards anticipate increases ranging from less than 1 per cent in the Atlantic States region to almost 11 per cent in the Allegheny region and to almost 13 per cent in the Middle Western region. Freight business was larger in the first quarter of 1927 than in the first quarter of any earlier year, and a decline was expected in the first quarter of 1928. The forecast of the shippers' boards for the second quarter, which is based on a survey made throughout the country, indicates that an increase in general business activity of considerable proportions is expected by men engaged in almost all branches of production and commerce.

The principal immediate need of the railways is for more freight business. It would be easy to become too enthusiastic over the improvement in the trend of net operating income shown in January and February. Total operating revenues in those months were $914,000,000, a decrease of $43,000,000, or 4.5 per cent, as compared with total earnings in the first two months of 1927. Operating expenses were $712,000,000, which represented a reduction of $38,000,000, or 5.1 per cent, as compared with those for the first two months of 1927. When operating expenses are reduced more in proportion than total earnings, it is usually largely because of retrenchments in expenditures for maintenance.

And, in fact, expenditures for both maintenance of equipment and maintenance of way have been in process of curtailment for several months. This has involved reductions in the number of employees and in purchases of materials and supplies. Reductions of railway purchases tend to cause reductions in employment by manufacturers and also curtailment of their purchases of fuel, raw materials, etc. In December, 1927, the railways had only 1,660,338 employees, or 113,526 less than in December, 1926. Between July, 1927, and December, 1927, the number of their employees declined almost 163,000, and the number in December was smaller than in any other month since August, 1922, when the number had been abnormally reduced by the nation-wide strike of employees in their shops. The reductions in operating expenses in January and February were due in large measure to the policy of retrenchment reflected in the large decline in the number of employees which occurred in the latter part of 1927.

Retrenchment becomes necessary when business declines, and this is especially true in an industry such as the railroad, which is being conducted on a much narrower margin of profit than before the war and in which the average return earned on investment in 1927 was only 4.4 per cent. If long continued, however, it must result in deterioration of railroad physical properties and service.

It is very bad for employees who are thrown out of work and for manufacturers who are dependent on the railways for a market. Its immediate effects ramify and tend to cause stagnation throughout business, and if long continued it must cause serious trouble and losses to all branches of industry and commerce because of the deterioration of railway service to which it must lead. The railroad industry is so huge, it affords directly and indirectly a market for so many concerns and employment for so many people, and it is so vital to the general and economic welfare that it should be kept in condition to render good and adequate service, that the government's policy of narrowly restricting its net earnings even in years of prosperity becomes a serious menace to all classes of people in every period when traffic declines because of the sharp retrenchments it virtually forces the railroads to make.

With the prospects of freight business now apparently improving, it is to be hoped that there will also be an improvement in the government's policy of regulation in order that the railways may make, through the employment of more men, larger purchases of equipment, materials and supplies, and the rendering of good service, the contribution to the general prosperity that should be made by an industry of such magnitude.

The Meaning of Per Diem Figures

COMPARATIVE figures of per diem credits or debits cannot be used safely, as they are more or less generally, as a yardstick for measuring the relative efficiency of car movement, either as between railways, or on the same railway for different years. There are too many elements entering into per diem figures, other than efficient car movement, to admit of a comparison on that basis. In fact, without a thorough analysis, per diem figures reflect merely that a railway is so much money in or out of pocket, as the case may be.

Before making any attempt to use such figures in determining the results obtained in car movement, many factors must be considered. For example, the ownership of equipment is a potent factor. In this connection, there comes to mind a railway that has on its rails an average of 10,000 cars per day, with a total car ownership of 7,600 cars. Manifestly, at the end of the year, or at any other time, this railway must face a per diem debit. In any comparison of per diem figures, this railway would make a poor showing. Nevertheless, on this line, cars are handled efficiently and excellent results are being obtained. Another controlling factor is the class of commodity moving, taken in conjunction with the volume of the various classes of traffic, compared with the number of cars of each class owned. An analysis of this factor in the per diem figures of any railway will usually show that its influence is far greater in producing credits or debits than car movement. The percentage of unserviceable cars on the line also exercises considerable influence. Foreign bad order cars are fruitful producers of per diem debits. In this case, the controlling factor is the efficiency of inspection at interchange points, which has no connection with efficient or inefficent car movement.

Even after all of these factors have been taken into consideration, it is a difficult matter to obtain an accurate picture of relative car movement from the per diem figures. The influence of the various factors is to a certain extent indefinite and can only be represented by approximations. Per diem figures should be watched closely and their importance should not be overlooked. However, before any attempt is made to use them as measures of operating efficiency in car movement, much care should be taken or the conclusions are likely to be erroneous and misleading.

Should Ties Be Renewed Out of Face?

THE chief engineer of a large western railway, in discussing the opportunities for improvement in track maintenance practices, recently expressed the opinion that greater economy could be secured by periodic renewals of the track structure out of face. He contended that the complete replacement of ties and the general resurfacing of the track with considerable quantities of new ballast at the time of relaying the rails would result in placing the track in a condition that would call for little attention from section forces until the time for another general overhauling.

This, in general, is the practice on European railways. On the four English systems, for example, from 50 to 70 per cent of all ties inserted are used in out-of-face rebuilding of a small portion of the main-track mileage each year. It has been argued that European practices cannot be applied in America because out-of-face renewal is economical only if the usable ties removed are again inserted in track, and that this cannot be done in America because the value of a second-hand tie, as determined by its remaining availible life, is not sufficient to pay for the labor cost for re-inserting it. The nearest approach to European practice which is practicable in this country, it is contended, is to restrict major tie renewals to alternate years and to insist upon a minimum disturbance of the track structure in the intermediate years.

That improved practices have brought about a readjustment of values in this regard is evident from the fact that at least one American railroad has found it profitable to salvage released ties, for as reported by George J. Ray, chief engineer of the Delaware, Lackawanna & Western, in an address at the convention of the Roadmasters association last fall, that road has found it profitable to re-insert in secondary tracks 56 per cent of all treated ties removed from main tracks.

Furthermore, he indicated that it would soon be possible for that road to secure its side-track ties exclusively from those discarded from main-track service.

The track structure of American railroads differs in many respects from that in vogue in Europe, but with the greater attention that is being given to the protection of ties from decay and mechanical injury, and the introduction of increasingly heavy tie plates and stronger track fastenings, this difference is not now as marked as it was formerly. This raises the question whether the increasing similarity in track construction calls for a greater similarity in maintenance policies. It is a subject worth careful study.

Government Subsidizing of Competition with Railways

THE railways have wisely protested to Congress through A. P. Thom, general counsel, and Dr. C. S. Ducan, economist, of the Association of Railway Executives, against the proposed legislation to increase from five million to ten million dollars the capitalization of the Inland Waterways Corporation for the purpose of extension of its service. Usually the railways have refrained from having proposed inland waterway legislation discussed by men who could speak authoritatively for all of them. Experience seems to show that it is unwise for them to refrain from adopting a definite policy regarding any legislative or regulatory proposal affecting them or from having their views on it and the reasons for them authoritatively expressed. Most questions affecting them will fail to get consideration on their merits unless discussed by men who can speak for the railways as a whole.

The proposal to expand the service of the Inland Waterways Corporation at government expense is an extreme illustration of the many unfair and economically unsound proposals regarding transportation which are not only being advocated by politicians but even by many business men. Many of the same business men who advocate "keeping the government out of business" are ardent advocates of putting it more and more into the transportation business. What they apparently want is for it to stay out of their business, but not out of other people's business.

One argument advanced for the extensive development of inland waterways is that they will be needed to "relieve" the railways. They never will be needed to "relieve" the railways if the railways are fairly regulated. There is no limit to the extent to which the capacity of the railways can be expanded at a reasonable cost provided they are allowed to earn enough to pay a return on the capital required for expansion. Furthermore, most of the proposed inland waterways would "relieve" the railways of traffic only in months of favorable weather conditions when they are best able to han-

dle it, and throw it back on them in seasons of bad weather when it is most difficult to handle it.

"Cheapening" Transportation

Another argument made is that the development of inland waterways and an increase of the service upon them is needed to "cheapen transportation". But who has offered any real evidence that this will be the result? What is the cost of transportation on the proposed water routes going to be? Nobody has yet even estimated it. The Inland Waterways Corporation is now making rates lower than those of the competing railways, but everybody knows its rates do not cover all the costs of transportation. The railways have provided their own roadway, tracks and terminals and must, if possible, get rates that will enable them to pay a return on the investment. The rates charged by the water carriers include nothing for interest upon the investment in the waterways, which must be paid by the taxpayers. The railways must pay taxes upon the investment in their roadway, tracks and terminals, while no taxes are paid upon the government's investment in waterways. The wages paid by the railways are comparatively high and most of them have been fixed by awards made by federal government boards. We have no data regarding the wages being paid by either the Inland Waterways Corporation or privately owned inland water carriers, but it seems highly probable that they are lower than those paid by the railways.

It is beyond serious question that the total cost of transportation by every inland waterway in the country, excepting the Great Lakes, is higher now than by railway, and there is no good reason whatever for doubting that this always will be true. So-called "cheap" transportation by inland waterways usually means simply low rates to the shipper at the cost of high taxes to the taxpayer.

It is unfair and unsound economically for the government to so subsidize water competition with the railways that traffic will move by water at a higher total cost than it could be moved by rail. It is much more unfair and unsound for the government to engage in the actual rendering of water service in competition with the railways at a higher total cost than would be incurred by rail. This, nevertheless, is what the government has been doing by financing the Inland Waterways Corporation and rendering the Mississippi-Warrior barge service, and is what it is proposed it shall do on a much larger scale by those who favor legislation for doubling the capitalization of the Inland Waterways Corporation. The service of the Inland Waterways Corporation is simply a government-owned and operated service. It was begun as an experiment with the clear understanding that if it was a failure it would be abandoned and that if it was a success it would be turned over for operation by one or more private companies.

Forcing Railways to Help Competitors

Not only is it now proposed to have the government continue to operate it with an enlarged capitalization and service, but it is also proposed to apply additional regulation to the railways to force them to help make it a "success". General T. Q. Ashburn, the chief executive officer of the Waterways Corporation, asks for legislation authorizing the Interstate Commerce Commission to issue certificates for waterway operation and to require all connecting common carriers and their connections—that is, all railways—to join with the water carriers in through routes and joint rates, to fix minimum differentials under the all-rail rates for the water rates, and to establish divisions of the joint rates if the carriers are unable to agree. In other words, the commission is not to fix the rates to be charged by the government in conducting transportation through the Inland Waterways Corporation, but it is to be empowered to compel the railways to join in making rates which, if effective, will divert traffic from the railways. The water carriers can make their rates as low as they like to take traffic from the railways. The railways must not make rates to take traffic from the water carriers, but are to have their rates so regulated as to insure that the water carriers will take traffic from them.

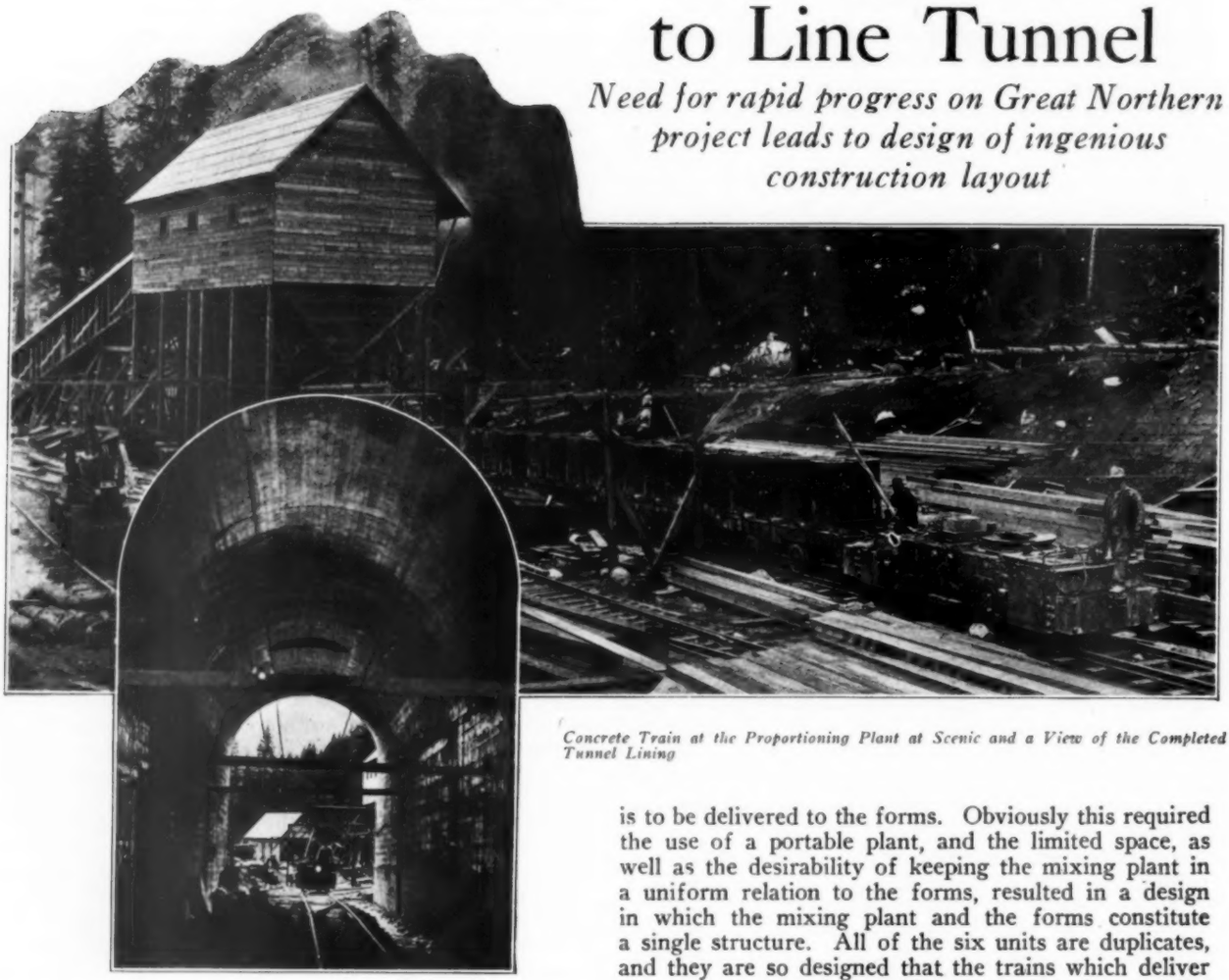
It is astounding that there should be business men who are so utterly inconsistent as to support such legislation. What would they say if it were proposed that Congress should adopt legislation and make appropriations to subsidize competition with coal mine operators, or manufacturers of automobiles, or farmers to "reduce the cost" of producing coal or automobiles or corn? What would they say if it were proposed further that the government should actually engage in the ownership and operation of coal mines, automobile factories and farms, and spend the taxpayer's money in thus "cheapening" coal, automobiles and corn? And yet there is no difference, as a matter of public policy or economic principle, between the government resorting to subsidies or government-operation to "cheapen" commodities and resorting to the same practices to "cheapen" transportation.

The railways at present are rendering good and adequate service; but they are not earning a "fair return", measured by any standard. To divert traffic from them is to divert from them earnings that they need. The tendency of this is either, first, to cause increases in their rates on the business they retain, or, secondly, to postpone the time when they will be able to earn a fair return, and thereby jeopardize their ability to continue to furnish satisfactory service. Apparently the nation must always depend upon the railways for much the greater part of its transportation service. There are large territories so remote from any waterways that they are dependent upon the railways alone for freight service. Most producing territories and markets that are closer to waterways must depend upon the railways for the transportation of freight to and from the waterways. Although the railways have lost much of their local passenger business the entire public is almost as dependent upon them as ever for long distance passenger service. Does the public want to divert so much traffic from the railways as to justify advances in rates upon their remaining traffic, or, if the rates on the remaining traffic are not to be advanced, to cripple them financially and physically?

The public does not want or mean to do either of these things. Nevertheless, the tendency of the policies advocated by many politicians and business men is to do one or both of them. They constantly favor governmental action to keep down or reduce railway rates and to subsidize competing means of transportation in order to divert traffic from the railways, although every student of economics knows that, other things being equal, the larger is the volume of traffic of the railways the lower are their unit cost of handling traffic and the lower they can make their rates. If the government dealt with all kinds of business in the same way many business men favor its dealing with transportation either we would soon have a socialist state or most business concerns would soon be insolvent.

Build a Special Concrete Plant to Line Tunnel

Need for rapid progress on Great Northern project leads to design of ingenious construction layout



Concrete Train at the Proportioning Plant at Scenic and a View of the Completed Tunnel Lining

IT WILL be necessary for the contractor on the tunnel which the Great Northern is driving through the Cascade range between Berne, Wash., and Scenic, to place 455 cu. yd. of concrete each day in 91 ft. of tunnel lining until October 1, 1928, if this part of the work is to be carried out in accordance with the schedule for the completion of the tunnel.* The total amount of concrete, including that already placed, which is required to line this tunnel throughout its entire length of 7.78 miles is estimated to be 200,000 cu. yd. Because of this large yardage, and the long haul, approximating four miles from each portal at the point of closure of the lining, an unusual concrete mixing plant has been devised which is integral with the forms, three of which plants are now in service at each end of the tunnel.

In any large construction project both the rate of progress and the cost of the work depend largely on the design of the construction plant. In the Cascade tunnel the distance from the portals to the point of closure of the concrete lining is too great to permit concrete to be handled to the point of deposit after mixing. For this reason it was decided to build a concrete mixing plant at the point where the concrete is to be delivered to the forms. Obviously this required the use of a portable plant, and the limited space, as well as the desirability of keeping the mixing plant in a uniform relation to the forms, resulted in a design in which the mixing plant and the forms constitute a single structure. All of the six units are duplicates, and they are so designed that the trains which deliver the concrete materials to the mixer and the mucking trains, from the enlargement work farther in, are able to operate freely through the plant, without interfering in any way with it or with each other.

The next problem was that of delivering the concrete materials to the mixing plant. It was plain, of course, that whatever method was devised should be so planned that the disposition of the material from the enlargement operations farther in would not be hampered. The plans finally worked out are substantially the same for both portals except in the manner of receiving the materials.

How the Materials are Received

The concrete materials consist of separate coarse and fine aggregates which are obtained from a gravel pit at Reeder, Wash,. about 40 miles west of Scenic where the railway maintains a gravel washing and crushing plant. The fine aggregate consists of a clean washed sand, while the coarse aggregate is a well graded washed and crushed gravel having a maximum size of 1½ in.

The west portal at Scenic is nearly two miles east of the connection between the new and old lines, and the permanent standard-gage track has not yet been laid between this connection and the portal. In its place the

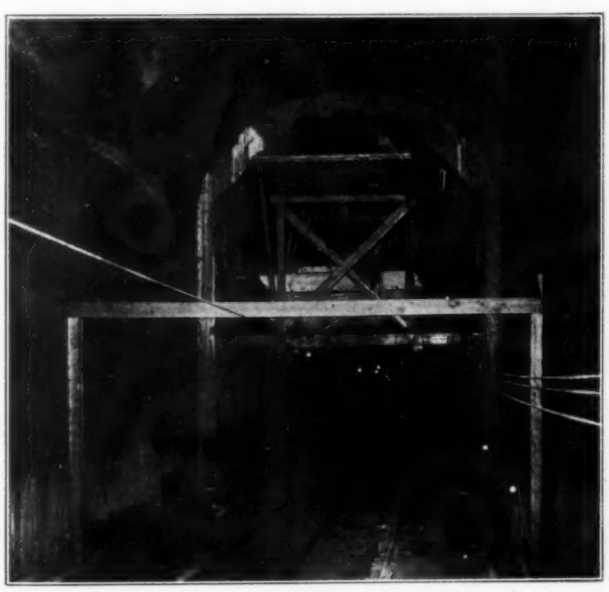
*NOTE—A full description of this tunnel, the construction method followed, and the conditions which were met up to December 15, 1926, appeared in the *Railway Age* for December 25, 1926.

contractor had built a three foot gage construction track from the tunnel to the main line for the purpose of constructing the embankment for the new main track and yard with the muck from the tunnel. Over this track the aggregates and cement, which are received in standard gage cars at Scenic, are transferred to the west portal in three-foot gage cars.

The aggregates are delivered in new Great Northern bottom dump coal cars to a storage plant at the junction with the main line, which has a capacity of 60 cars of coarse and 20 cars of fine aggregates. The cement is stored in a warehouse immediately adjacent to the aggregate storage. One narrow-gage train, consisting of five 6-cu. yd. Koppel manual dump cars, working between the storage plant and the west portal on two 12 hour shifts, is able to keep the concrete plant running continuously. This narrow-gage train is run under the aggregate bunkers and the cars are filled with coarse or fine aggregate as desired through spouts which are fitted with undercut gates. At the portal of the tunnel the cars are dumped into a hopper, from which the aggregate is hoisted by means of a belt conveyor to an 80-cu. yd. storage and proportioning plant, in which provision is also made for cement storage.

The large storage plant at Scenic is a covered frame structure supported on 12-in. by 12-in. lumber framed bents which rest on timber grillages. The proportioning plant, however, consists of covered frame storage bins supported on steel tower bents which in turn are founded on heavy three-ply timber grillages to avoid distortion by settlement which would affect the adjustment of the measuring and weighing devices.

The east portal is near the main line and at this point the aggregates are received in standard-gage cars as at Scenic. The bunkers into which they are dumped, however, are fitted with measuring and weighing devices, so that here the aggregates are delivered directly to the concrete train without the intermediate haulage which is necessary at Scenic. At Berne, the cement is stored in a separate building adjacent to the bunkers and the concrete train stops at the building for the cement after the aggregates have been loaded in the containers.



A View at the Rear End of the Traveler Which Combines Both Forms and Mixing Plant

Water in the Pioneer Tunnel

Proportioning the Materials

The concrete for the lining is a 1:2:4 mix. The materials for the lining at the west end are proportioned at the storage and proportioning plant which is located just west of the portal. The proportioning plant is equipped with a volumetric device on the coarse aggregate bins and scales on the fine aggregate bins for weighing this material. The aggregates are measured into Blaw-Knox batch boxes. Four of these boxes or containers, each of which holds sufficient material for a ½-cu. yd. batch, are mounted on a 3-ft gage flat car built specially for this work. Each of the containers, which have also been designed specially for this job contains a separate compartment for the cement, to prevent it from coming in contact with the wet gravel during the period of haulage from the proportioning plant to the mixer.

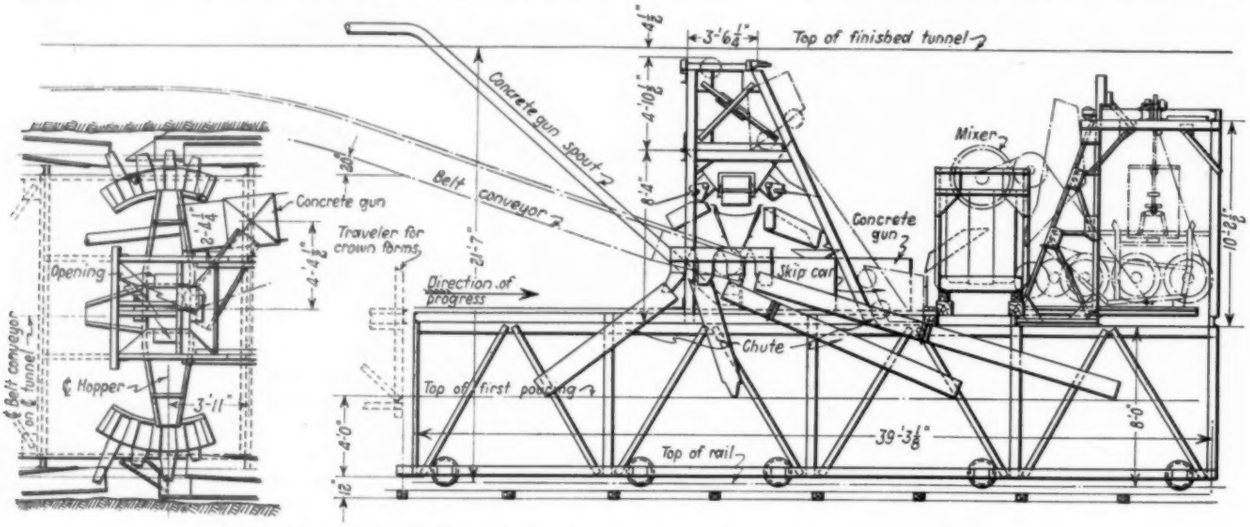
Two trains of eight cars each are used to haul the containers between the proportioning plant and the mixer, although the number of cars in the trains will be increased to 12 as the lining progresses farther from the portal. One of these trains is run under the coarse aggregate bin and each of the 32 containers receives the correct amount of gravel. They are then passed under the fine aggregate bin to receive their proper weight of sand and finally the cement is measured into the containers by emptying the stipulated number of cement sacks, into each of the cement compartments. Under the arrangement in effect, one train is in the tunnel serving the mixer while the other is loading at the proportioning plant. As soon as a train is loaded it proceeds at once to the mixer, using care, however, not to interfere with the trains hauling muck from the enlargement operations which are under way beyond the mixers.

The length of the forms was determined by the distance between trolley supports, in the roof of the tunnel, which is 75 ft. As this length would have been too great the forms were made 37 ft. 6 in. long so that two movements cover the distance between two adjacent trolley supports.

Both walls of the tunnel carry numerous conduits

for electric transmission lines, signals and communication. It was necessary that these conduits be placed accurately, and to assure this being done, each wall to a point above the highest conduit, about four feet above the rail, was placed as a separate operation. In order to accomplish this each form traveler was made 75 ft. long, the advance end having forms extending only to a point above the conduits. The upper part of this section of the form traveler is occupied by the mixing platform, upon which is installed the mixing plant, the elevators and the chuting arrangement. The deck of the platform is approximately nine feet above the floor of the tunnel, but although the platform itself is only six inches thick, the under clearance is reduced to 7 ft. 3 in. by the bracing of the traveler.

When the forms have been filled they are allowed to remain until the concrete has hardened before they are disturbed. At the end of this period they are collapsed and the whole structure is moved forward to the next position by means of one of the 20-ton motors which are used to haul the concrete trains.



Vertical Longitudinal Section and Part Plan of One of the Concrete Plants

The mixing plant, which is mounted on the platform of the advance section of the unit, consists of an electric hoist, a loading skip which serves the mixer, a concrete mixer, a concrete skip, a general central concrete hopper, a belt conveyor, concrete chutes, and a concrete gun, together with the necessary motors and water and air lines. To get all this equipment in a tunnel 16 ft. wide and 24 ft. high, at the highest part of the roof, and at the same time provide room below for two tracks, one for the mucking trains and the other for the concreting train, required some rather nice work in providing clearances. One of the drawings shows the very close clearances with which these plants were designed.

The Cycle of Operation at a Mixing Plant

When the train with its loaded containers reaches the mixing plant it pulls through to the forward end of the mixing platform and an electric hoist lifts one of the containers from a flat car to the mixing platform, where it is placed over the loading skip of the mixer and dumped. As soon as the empty container is returned to the car, another is hoisted in like manner and so on until all are emptied.

As soon as the container with all the materials required for the batch of concrete is dumped, the loading skip is elevated and its contents discharged, together with the necessary water, into a Smith non-tilting batch mixer. After mixing for 1½ min. the concrete is discharged into a skip car which elevates it to a general central hopper.

From this hopper, by means of specially arranged gates, the concrete is directed, first, into the forms for the advance section where the conduits are being placed; second, on to a belt conveyor by means of which it is elevated to about the level of the springing line, at which point it is struck off into chutes on either side of the belt. These chutes convey the concrete to that section of the side walls between the top of the conduit and a point slightly below the springing line; third, it may be delivered into a Ransome concrete gun which is used for placing the concrete above the springing line. The conveyor, which is of the Northern type, is 43 ft. long and is supported on a steel lattice frame. The forms were supplied by the Blaw-Knox Co., and the hoist by the Clyde Iron Works.

The sequence of operations at a single plant has been given. There is also a cycle of operation for the group of three plants at each end of the tunnel. Each of these six plants is operated in the manner described but only one plant at each end of the tunnel is placing concrete at any given time. The three plants at either end are placed about 1800 feet apart, without reference to the location of the cross cuts leading to the pioneer tunnel. While the concrete at one plant is being placed the next one is idle to allow the concrete to set, while at the third the forms are being advanced and the bulkheads constructed to permit the placing of the concrete by the following shift.

The mixing plants are able to deposit about 16 cu. yd. of concrete an hour. One position of the forms requires the placing of approximately 187.5 cu. yd. of concrete. It has been found that it is safe to remove the forms in from 15 to 24 hours so that the weekly progress runs from 7 to 11 settings or from 262.5 ft. to 412.5 ft. of completed tunnel at each end weekly.

Five trains are employed in haulage in connection with the concreting operation, two at Berne, two

in the tunnel at Scenic and one between the west portal and the storage plant at the main line. The motive power for all five of the trains consists of 20-ton General Electric tunnel motors.

Four men are required to operate the proportioning plant, which includes the filling of the containers and the operating of the conveyor. A motorman and a brakeman are employed on each of the haulage trains, while 10 men are required at the mixing plant. This makes a total of 18 men on each eight-hour shift who are engaged on the concreting operation at each end of the tunnel.

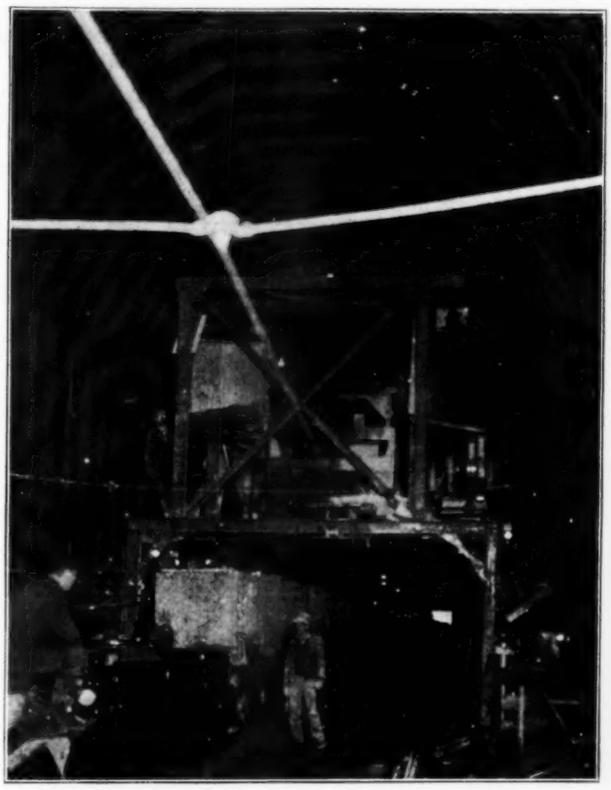
Water Under Pressure Was Encountered

Aside from the concreting operations, the principal feature of recent interest in this tunnel project has arisen from the large amount of water encountered. That portion of the tunnel between Berne and the Mill Creek shaft has remained dry. West from Mill Creek shaft, the amount of water encountered had reached a maximum of 500 gal. per min. up to September 1, but soon after that date, additional flows increased the discharge so that by December 1, about 1,500 gal per min. was being pumped from Mill Creek shaft. In the article which appeared in the *Railway Age* for December 25, 1926, the water conditions which had been met up to December 15, 1926, were described in detail. However, on January 5, 1927, at a point 9,215 ft. east of the west portal, water in quantity and under great pressure was encountered in the pioneer tunnel. The flow at the beginning amounted to about 1,500 gal. per min., but this increased to about 2,100 gal. per min. until at a point 10,800 ft. from the portal the flow increased very suddenly to 10,300 gal. per min. The rate of flow then decreased gradually to 6,300 gal. per min. Since then small flows have been met which have been sufficient to retard operations and maintain the total discharge at about 6,500 gal. per min.

In addition to this excessive flow the pressure under which the water entered the tunnel presented difficulties which are seldom encountered in tunnel work. Pressures up to 180 lb. per sq. in. were measured, and from observations and data obtained by the contractor and the engineers of the railway it is believed that pressures as high as 600 lb. per sq. in. existed. In one instance when a stream suddenly broke through into a drill hole the pressure of the water drove the 13-ft. steel bar out of the hole and back 50 ft. from the face. This volume of water added greatly to the difficulties which the mucking crew faced in trying to remove the muck, for in many instances there was as much as six feet of water between the muck pile and the working face. Furthermore, it was a matter of considerable difficulty to find and clean up the fly rock in a stream carrying this amount of water and running with considerable velocity.

It will be remembered that during the construction of the Moffat tunnel in Colorado an abnormal flow of water was encountered at the upper end of the tunnel where drainage by gravity was not possible, and that the work at this end was hampered seriously for a long period. It is interesting to compare the maximum flow of 3,200 gal. per min. in this tunnel with the maximum of 10,300 gal. per min. and the long sustained flow of 6,000 gal. per min. or more which occurred at Scenic.

The contract stipulates that the entire work shall be complete not later than October 30, 1928. Clearing the sites for the camps was started on December 1, 1925, four days after the contract was awarded. Work on the Mill Creek shaft and on the main and pioneer tunnels at Berne and Scenic was begun at short intervals between this date and January 30, 1926, at which time operations were under way at all of these points. In March, 1926, after the preliminary work had been



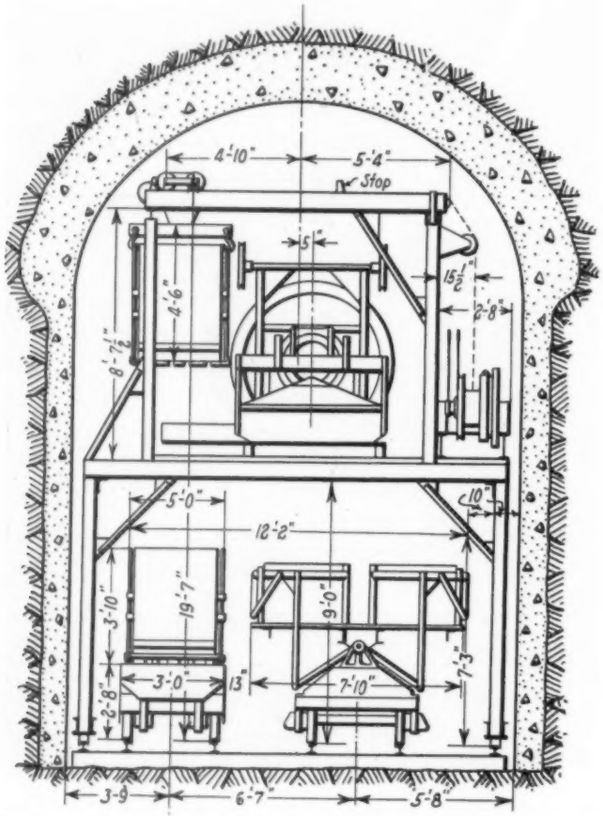
Delivering a Trainload of Concrete Materials to a Mixer Plant in the Tunnel

finished the contractor and the engineers for the railway collaborated to produce a chart upon which was delineated the progress which must be made at every point and on every part of the work in order to complete it in the specified time.

While important items of the work are approximately 140 days ahead of schedule, work on the enlargement to full tunnel section at Scenic has been retarded where the water and a faulted condition of the rock have combined to interfere with operations. The broken and faulted conditions of the rock in certain sections of the tunnel have made it necessary to change from the center heading method to the top heading method in those sections. Obviously, this is a much slower operation, especially as full timbering is required, than that of enlarging to full section from a center heading by the ring method, as is being done on the remainder of the work where the ground conditions permit. To offset this delay the contractor has introduced an additional Model 40 Marion shovel at Crosscut No. 8, where the full face is being removed in one operation. This makes three points at which the enlargement at the west end is being carried on so that a higher rate of progress may reasonably be expected than has heretofore been made unless serious difficulties are encountered in the portions of the tunnel not yet excavated.

A. Guthrie & Co., of St. Louis have the contract for

the tunnel and the line changes which are incidental to the main project. J C. Baxter, vice-president, has general charge for the contractor; W. E. Conroy is general superintendent in direct charge of the work, and H. J. King, F. J. Kane and C. G. Jones are camp superintendents at Scenic, Mill Creek and Berne, re-



The Concrete Plants Were Designed with Close Clearances

spectively. The concreting plant which has been described was designed by Mr. Baxter.

The project is being carried out under the general direction of J. R. W. Davis, chief engineer of the Great Northern. Col. Frederick Mears, assistant chief engineer, has direct charge for the railroad, and M. J. C. Andrews is resident engineer.

Railroad Accidents in 1927

THE Interstate Commerce Commission has issued its preliminary memorandum, subject to revision, giving a summary of accidents reported by the steam railways of the United States for the 12 months ending December, 1927. It shows an unparalleled record of only ten passengers killed in train accidents in that time; the lowest figure recorded since the beginning of the government records in 1889. The lowest total heretofore reported was 30, in 1895, which was a year of comparatively light traffic; and the total volume of railroad business was, of course, much smaller 30 years ago than it is now. The records of passengers killed in train accidents on American railroads for the last ten years have totaled:

1918	286	1923	54
1919	110	1924	49
1920	95	1925	98
1921	110	1926	79
1922	106	1927	10

The total number of passengers killed in "train service" accidents in 1927 was five more than in 1926, so the term "train service accidents" includes such cases as a passenger being struck by a locomotive or car, or being killed or injured getting on or off the train. While the reduction of those killed under the head of "train" accidents is 87 per cent, the reduction, including those killed under "train" accidents and "train service" accidents, is only about 42 per cent.

In other features, the present report shows no unusual changes from the preceding year, though there is a footnote calling attention, under the head of train service accidents, to a detail never before published, namely, the number of suicides. Of the killed, under this head, 171 are classed as suicides, and of the injured, 18 cases are entered as attempted suicide. The total number of trespassers killed by being struck or run over at other places than at public crossings (1959) is 174 more than the total in 1926.

The comparisons with the principal totals for the two years last preceding, are given in the table.

Casualties on Railroads, 1925-26-27

	1927		1926		1925	
Passengers	Killed	Injured	Killed	Injured	Killed	Injured
In train accidents	10	1,511	79	1,829	83	2,053
Train service accidents	78	2,382	73	2,632	88	2,899
Total of above	88	3,893	152	4,461	171	4,952
Non-train accidents	3	674	3	688	5	691
Grand Total	91	4,567	155	5,149	176	5,643
Employees						
In train accidents	194	1,211	190	1,589	232	1,485
Train service accidents	975	26,714	1,102	32,337	996	30,760
Total of above	1,169	27,925	1,295	33,926	1,228	32,245
Non-train accidents	324	59,642	295	77,315	295	86,390
Grand Total	1,493	87,567	1,590	111,241	1,523	118,635
Other Persons						
In train accidents	82	350	91	498	103	376
Train service accidents	5,214	10,452	5,154	10,764	4,862	10,420
Total of above	5,296	10,802	5,245	11,262	4,965	10,796
Non-train accidents	112	1,880	103	2,583	102	2,361
Grand Total	5,408	12,682	5,348	13,845	5,067	13,157
Total, All Classes of Persons						
In train accidents	286	3,072	360	3,916	418	3,912
Train service accidents	6,267	39,548	6,329	45,733	5,946	44,081
Total of above	6,553	42,620	6,689	49,649	6,364	47,993
Non-train accidents	439	62,196	401	80,586	402	89,442
Grand Total	6,992	104,816	7,090	130,235	6,766	137,435

The total number of employees killed, all causes (1493) averages 34 per 100 million man-hours worked, as compared with 35 in the preceding year; the average injured (1987) is, however, decidedly smaller than in 1926, when it was 2,441.

The total number of persons killed at highway grade crossings in 1927 was 2,371 which is almost five per cent less than the total (2,491) in 1926.

The total number of employees killed in train service last year, 975, is 11½ per cent less than the total in 1926. The amount of train service, as measured by locomotive miles—1740.4 millions—was about 3½ per cent less than in 1926.

"Cross Crossings Cautiously" is to be preached by the American Railway Association during the coming summer by large and small posters of new design and by means of a 12-page circular, in which are condensed the salient features of the lessons taught in the crossing safety campaigns of the past few years. The well-known admonition already frequently published and republished are in this pamphlet re-edited, and there is a diagram showing how comparatively small is the number of persons killed at railroad crossings as compared with the number of fatalities occurring annually on streets and highways in the United States. The salient paragraphs in the recent supreme court decision, on how to avoid disaster at crossings, are reprinted.

Government Operation of Barge Lines*

An outline of the railway attitude toward proposed extensions of waterway service

By C. S. Duncan
Economist, Association of Railway Executives

THIS bill proposes a modification of the existing law which created the Inland Waterways Corporation with respect to Section 2 and Section 3 of that act. Among other things, it proposes to increase the capitalization of the Inland Waterways Corporation from the present five million dollars to fifteen million dollars and authorizes the appropriation of ten million dollars. It proposes, further, that when the improvement of any tributary or connecting waterway of the Mississippi river shall have been advanced to a point where within two years thereafter there will be completed a sufficient and dependable channel for safe operation of barges and towboats, upon the advice and certification by the Chief of Engineers of the United States Army, the Secretary of War shall have a survey made of potential traffic, of terminal facilities and joint traffic arrangements and to report thereon to Congress with his recommendation as to whether or not in the public interest the servive of the Inland Waterways Corporation should be extended to such tributaries or connecting waterways.

It is my purpose in appearing before you to raise certain inquiries with respect to the bill now before the committee in the hope that these inquiries will be satisfactorily answered before final action is taken on H. R. 10710.

Government ownership and operation of barge service on the Warrior and Mississippi rivers developed directly out of the activities of the Council of National Defense, which was organized by act of Congress August 29, 1916, in order to coordinate industries and resources to insure national security and welfare.

An Experimental Enterprise Only

While the original purpose of government interest in and government operation of inland waterway service, and particularly on the Warrior and Mississippi rivers, was to secure relief from war-time freight congestion on the railroads, and while this purpose continued through war activities, the operation in the post-war period, and particularly under the Inland Waterways Corporation, has been for an entirely different purpose.

Armistice Day found the United States Railroad Administration burdened with the responsibility of carrying on this transportation service in precisely the same way as it had the responsibility of carrying on the rail service. Some method of disposing of the water equipment had to be determined, just as a method for disposing of the railroads had to be determined. Until this determination was made, the Railroad Administration was under the responsibility of conducting water transportation service just as it was under the responsibility of conducting rail service until the method of disposal in each case had finally been determined and carried out.

Section 201 of the Transportation Act transferred the responsibility of conducting the water transportation service to the Secretary of War. The final act in this case followed the House amendment on this section, rather than the Senate amendment which transferred these transportation facilities to the Shipping Board. As to the purpose of continued government operation contained in Section 201 of the Transportation Act, I quote the words of one of the proponents of that act:

"We believed that it was absolutely essential, in view of the fact that the government had already invested in something like $9,000,000 in the barge line on the lower rivers and had commitments for several million dollars more, that this new venture should not fail, but should be continued in order to demonstrate its practicability and in order to aid transportation and relieve congestion."

(Esch, Speech Feb. 21, 1920, on Conference Report.)

It will be observed from this statement that operation upon the Mississippi and Warrior rivers by the government was continued, first, for the purpose of utilizing equipment owned by the government for which it had no other use, second, to demonstrate the practicability of such service and, third, because it was believed that such service was necessary to relieve transportation shortages.

On September 10, 1923, the Chief of the Inland and Coastwise Waterway Service submitted a report to his superior officer, the Secretary of War, which contained the draft of proposed legislation for the Mississippi-Warrior River Service. It is apparent that this draft of proposed legislation, appearing on pages 14-16 of the Annual Report of the Chief of Inland and Coastwise Waterway Service for the fiscal year ending June 30, 1923, formed the basis of the bill upon which hearings were held before this committee beginning February 26, 1924.

It has been our clear and definite understanding, not only from the suggestions contained in the report to the Secretary of War above referred to, not only in the testimony of witnesses favoring the passage of such legislation, but also in the report from the Committee on Interstate and Foreign Commerce recommending the passage of the bill, in the addresses by proponents of the bill on the floor of the House and in the bill itself as it finally passed, that as stated in the law the object of this legislation is

"for the purpose of carrying on operations of the government-owned inland and coastwise waterways system to the point where the system can be transferred to private operation to the best advantage of the government".

These words indicate the new purpose behind the legislative action to create the Inland Waterways Corporation, which purpose has continued to be the goal aimed at by this government experiment in operating water service on these two rivers, as we understand it.

From all of these statements we have gained the clear and definite understanding that government operation by the Inland Waterways Corporation and under the

* From a statement before House Committee on Interstate and Foreign Commerce on April 6, 1928 on H.R. 10,710.

provisions of the Act approved June 3, 1924, was merely and solely to be an experimental enterprise. It was to be an experimental demonstration, conducted by the Secretary of War until such time as its success or failure might be made apparent. It was to be conducted precisely as a private operation would have to be conducted. The crucial test of its success or failure is to be whether or not private capital will invest in it. With respect to the length of time the demonstration was to continue, it may be said that there was clearly and definitely in the mind of those who proposed and advocated the act that a five-year period would be sufficient to demonstrate the feasibility or infeasibility of such operation.

Experiment to Demonstrate Feasibility of Private Operation

It is our understanding further that the experimental demonstration to be carried on by the government corporation was not only to show the feasibility of water transportation in itself, but the feasibility of such operation as a private enterprise. It is assumed that Section (c) of the act of June 3, 1924, which subjects the operation of the transportation and terminal facilities under that act to the provisions of the Interstate Commerce Act, as amended, "in the same manner and to the same extent as if such facilities were privately owned and operated," is unquestioned proof that our understanding is correct.

The government operation of barge lines is to be judged by an absolute and direct comparison with private operation. This certainly means that it shall account for all items of expenditure which a private enterprise would have to meet and should be required to face all the problems which a private operation would have to face, and that its success shall fairly be judged by the remaining profits, after all expenses are met, as to whether or not they are such as to attract private capital.

The Essentials of a Fair Test

It can not be disputed that an examination of the record will show that those in charge of the government operation of inland water transportation service got practically what they asked for in the legislative Act of June 3, 1924. In the testimony presented by the chief executive, under the Secretary of War, in charge of the operations of the barge lines, certain factors were set up which he said were absolutely essential to the success of such an undertaking. The so-called essentials will be stated in the language of the witness:

1. "There must be a suitable navigable waterway."

We do not understand that there is now complaint from the operators of the Warrior River-Mississippi Barge Line with respect to the first essential.

2. "There must be suitably designed equipment."

Under the first appropriation of government funds of twelve million dollars by the Director General during federal control of railroads the initial movement was undertaken by the purchase of towboats and barges that had been operating for several years by private operation at a very considerable loss. While these towboats and barges were quite limited in capacity and not strictly modern in every sense of the word, they did represent the best thought in river transportation up to ten years ago. By the purchase of this equipment, moreover, the government secured a trained and efficient operating personnel and the river navigation was started at once as a going concern in September, 1918.

A new fleet of towboats and barges of large capacity was later secured by the government. They were designed and their construction was supervised by naval architects of international repute. This fleet consisted of six very powerful towboats and forty large steel barges, 2,000 tons cargo capacity each. They were placed in operation in January, 1922, and have been operated ever since between St. Louis and New Orleans. When these new modern towboats and barges were placed in service the government had spent nearly ten million dollars for equipment, the great part of which was for these new modern towboats and barges of large capacity.

Other equipment purchased and constructed added to the fleet until in 1923 the equipment consisted of ten towboats, two self-propelled barges, 53 cargo barges and 30 items of miscellaneous equipment consisting of unloaders, fuel barges, car floats, tug boats, tankers and oil barges.

Still another fleet of powerful, modern barges and towboats was constructed under the appropriation of nearly four million dollars made by the United States Shipping Board in 1917 at the instance of the President of the United States, although these boats were not built for a few years thereafter. This added four modern, powerful towboats and 19 modern large capacity steel barges to the government fleet, which on December 31, 1926, was as follows on the Mississippi river:

14 towboats of which 11 were modern and of large capacity;
72 cargo barges of which 61 were modern and of large capacity;
3 modern large capacity self-propelled barges;
37 items of miscellaneous auxiliary floating units.

With the appropriation of five million dollars under the Act of Congress approved June 3, 1924, still more equipment was provided, the total cost of facilities today on the Mississippi alone closely approximating twenty million dollars. As most of this was spent for new modern steel floating carriers of large capacity, designed and built by naval experts, it must be presumed that their performance and showing illustrate the best that can be expected from modern equipment.

3. "There must be suitable terminals."

The chief executive officer under the Secretary of War in his annual report for 1926 writes, with apparently great satisfaction of the terminals that have been established on the Mississippi River and on the Warrior River.

4. "There must be balanced freight, up stream and down stream."

On this point the chief executive officer of the Inland Waterways Corporation in his 1926 report says:

"Contrary to all expectations, up stream traffic, supposed to be nil, has become the greatest part of our cargo."

The record shows well-balanced traffic on these operations.

5. "There must be cooperation with the railroads."

On this point the chief executive officer of the Inland Waterways Corporation has said:

"We have been able through our relations with the railroads and through their cooperation (some of them are very strong in their cooperation) to extend the benefits of our cheap rates to 42 states. We have 165 railroads."

(Proceedings of National Rivers and Harbors Congress, 1926, p. 56).

The statement here given can only mean that this alleged essential factor has been satisfactorily met.

6. "There must be an equitable division of accruing revenue between the participants of a joint haul by rail and water, or water and highway."

With regard to this essential factor the annual report says as of 1926:

"The Interstate Commerce Commission is handling this matter satisfactorily, and has laid down a course of procedure that will eventually solve this problem; not today, or next week, but in the course of time."

Port-to-Port Rates Free of Regulation

The Inland Waterways Corporation, organized for the purpose of carrying out the mandate and purpose of Congress as expressed in Sections 201 and 500 of the Transportation Act, 1920, and created by the "Act to Create the Inland Waterways Corporation", which was approved June 3, 1924, operates under the following provisions of that Act:

Section 3 (c) The operation of the transportation and terminal facilities under this Act shall be subject to the provisions of the Interstate Commerce Act, as amended, and to the provisions of the Shipping Act, 1916, as amended, in the same manner and to the same extent as if such facilities were privately owned and operated; and all vessels of the corporation operated and employed solely as merchant vessels shall be subject to all other laws, regulations and liabilities governing merchant vessels."

Under Section 500 of the Transportation Act there is the declared policy of Congress—

"to promote, encourage, and develop water transportation, service, and facilities in connection with the commerce of the United States, and to foster and preserve in full vigor both rail and water transportation."

Section 201 of the Transportation Act places the operation of inland water service under the provisions of the Interstate Commerce Act, being substantially the same as paragraph c of the Act to create the Inland Waterways Corporation.

It will be noted that these provisions bring the operation of the Warrior River-Mississippi Barge Service under those terms of the Interstate Commerce Act which specifically apply to common carrier service by water. The most important of these provisions are as follows:

1. The provisions of Section 1 (a), namely—

"That the provisions of this Act shall apply to common carriers that are engaged in the transportation of passengers or property wholly by railroad, *or partly by railroad and partly by water, when both are used under a common control, management, or arrangement for a continuous carriage or shipment.*"

Thus by definition the application of the Interstate Commerce Act is limited to that traffic which constitutes a continuous carriage or shipment by water and rail by a company under a common control or management, or having arrangement with a railroad for a continuous carriage or shipment.

2. Within this limited jurisdiction the commission has power to establish physical connection between rail lines and docks, determine terms of construction and operation of dock and wharf facilities, and of spur lines, and can issue certificates of convenience and necessity for such construction.

3. Within this limited jurisdiction also the commission is specifically granted power to establish through routes and maximum joint rates and determine all terms and conditions under which water and rail lines shall be operated in the handling of through traffic.

4. The commission further within its limited jurisdiction, that is, on through traffic, has the power to establish proportional rates to and from ports.

By the Act of June 3, 1924, the operations of transportation and terminal facilities of the Inland Waterways Corporation are subject also to "the provisions of the Shipping Act, 1916, as amended". An examination of Section 1 of that Act, however, reveals the fact that, by definition, they apply only to "common carriers by water in foreign commerce", common carriers by water in interstate commerce on the high seas or the Great Lakes or regular routes from port to port. And Section 33 states—

"That this Act shall not be construed to affect the power or jurisdiction of the Interstate Commerce Commission, nor to confer upon the board concurrent power or jurisdiction over any matter within the power or jurisdiction of such commission; nor shall this Act be construed to apply to intrastate commerce."

Thus the operations of transportation and terminal facilities of the Inland Waterways Corporation are completely excluded from the regulatory provisions of that act.

It would thus appear that the Inland Waterways Corporation is, as the chairman and chief executive of that corporation states,

"free to set its purely port to port rates without reference to the Interstate Commerce Commission."

No Protection for Railways Against Water Competition

It must be remembered, however, that it lies within the jurisdiction of the Interstate Commerce Commission, under paragraph 2 of Section 4 of the Interstate Commerce Act, to see to it that if a carrier by rail, that is in competition with a water route, reduces the rates on the carriage of any kind of freight to and from competitive points, that carrier shall not be permitted to increase such rates again until, after a hearing by the commission, it shall be found that such proposed increased rates rest upon changed conditions other than the elimination of water competition.

If this interpretation of the law is correct, then we must conclude that the Inland Waterways Corporation can set its rates from port to port as it chooses without reference to the commission, and can manage and control such service freely without reference to the commission.

In a word, the water lines now are protected fully against the rail competition without a corresponding protection for the railroads as against the water competition.

So much for these regulatory provisions in the existing law which govern the relationship between the railroads and the operations by the Inland Waterways Corporation.

These six factors enumerated by the chief executive of the Inland Waterways Corporation, as appears from the record, have all been reasonably and satisfactorily met.

Commenting with apparent satisfaction on all these essential factors in successful water transportation, the annual report of the chief executive of the Inland Waterways Corporation says:

"It is my opinion that the problem has been solved on the lower Mississippi alone, and that it could be operated by private capital as a profitable venture; but those conditions necessary to the successful operation of a great common carrier have not yet been created upon the Warrior or the upper Mississippi division; nor is it probable that they could be created by private capital. The government must therefore continue its demonstration and experimental work upon these rivers until they, too, have become self-supporting, supplying the necessary funds for such purposes from the profits of operation of the lower Mississippi section."

Continued Government Operation Contrary To Established Policy

As we understand it, therefore, the Inland Waterways Corporation was created as an instrument through which the government intended to put on an experimental demonstration as to the feasibility of successful inland water transportation until such time and only until such time as its success or failure might be made ap-

parent. In the words of the committee's report recommending the passage of the act creating the Inland Waterways Corporation—

"After the enactment of this bill the Secretary of War can operate the barge lines in accordance with the same business principles that would be followed by a private transportation company. And it is the opinion of the committee that if they can not then operate it successfully and at a fair profit private capital could not do so; that further expenditure of government funds for the improvement of our inland waterways would be useless and should be stopped."

The essential condition set up by this experimental demonstration was that this corporation should operate precisely as a private corporation would need to operate. The alleged handicaps under which operations were carried on prior to the creation of this corporation were removed by legislative action on June 3, 1924. In so far as we can see, the essential factors for successful transportation by water, if success here is possible, have been reasonably met. Government barge operation has been in service nearly ten years. The first five years were undoubtedly formative and development years. The last five years, 1923 to 1927, inclusive, have been substantially normal years and probably as nearly normal as any years to come.

We, therefore, propound our first inquiry: Is it not a fact that indefinitely continued government subsidy, ownership and operation of inland water transportation in competition with private enterprise is contrary to this established public policy?

Position of the Railroads

As a basis for further inquiries we desire to state the position of the railroads with respect broadly to the entire question raised here:

First: The railroads have offered, and are offering no opposition to federal expenditures for improvements on these inland waterways.

Second: The railroads have offered and are offering no objection to this experimental demonstration under the provisions of the "Act to create the Inland Waterways Corporation," as they understand those provisions and their purpose. They voiced no opposition to that bill and did not appear at the hearings. They do not offer any objection to the carrying out of a fair test of the practicability and feasibility of transportation on inland waterways under the terms that have been stipulated, namely,

a. That it be carried on as a private corporation would have to carry on.
b. That its test of success is whether or not private capital will invest in it.
c. That with attendant success, the government will immediately dispose of these facilities to private enterprise.
d. That, lacking this success, it will be deemed a failure and further government subsidy will cease.

Third: The railroads have steadfastly refused to be placed in a position of opposition to the development of any legitimate form of transportation service, whether on the water, in the air or over the highways, that is economically justifiable, that is, pays its own way, and is demanded by the public. The people of this country, of course, have an undisputed right to every means of transportation they want on this basis.

Fourth: The rail carriers do desire, however, that a fair trial of this experiment shall be made. In their opinion the requirements for a fair trial are—

1. A fair competitive basis is where all the costs are known and are given due consideration.
2. That in so far as there is common carrier service on inland waterways in competition with common carrier service by rail, there should in all fairness be common provisions for regulation in that common carrier service, as to—
   a. Accounting requirements,
   b. Rates schedules published and adherred to, and
   c. Full responsibility for adequacy, dependability and economy of service.

Fair competition can not be had where one competitor is compelled to operate under full regulation and the other competitor is left "free to set its purely port to port rates without reference to the Interstate Commerce Commission".

In its own words, it is "free to set its purely port to port rates without reference to the Interstate Commerce Commission." It is obvious that this means a straight 20 per cent discount to the shipper from the corresponding rail freight rates.

The rate paid for rail transportation is all-inclusive as to expense. No other expenses are paid directly or indirectly by the shippers. Rail transportation expenses include in addition to the cost of the actual moving of trains, such other costs as

a. The maintenance of equipment and handling of freight;
b. The provision and maintenance of its right of way, roadbed and track;
c. The payment of fixed charges on the investment in equipment;
d. The provision of terminals at the entire expense of the railroads; and
e. Large payments to the government for taxes in various forms.

Except for a portion of terminal charges, none of the last four expenses enumerated are included in the charges on which the rates to the shipper by the Mississippi river barge line are based.

The cost of shipping by the barge line includes rates paid by the shipper,

a. Plus the cost to the federal taxpayer of providing and maintaining a navigable channel:
b. Plus fixed charges on the government investment in floating equipment and terminals;
c. Plus the cost to the municipal taxpayers of providing local terminals at less than cost;
d. Plus the sacrifice of local, state and federal taxes that would be paid by a private corporation.

We do not know what these excess costs are in addition to the rate paid by the shipper. No one knows. But sufficient information is available to indicate that they greatly exceed the 20 per cent reduction in rail rates supplied by government bounty. For a full knowledge with respect to this experimental demonstration this committee and the people of the country should have set up for them such cost accounts as would show whether or not the shippers fortunate enough to be able to utilize the barge lines are really paying the full cost of their transportation or are being subsidized, and to what extent, by the federal government at the expense of all the people.

Upon this basis we make this further inquiry: Does not the fact that the proposal of the pending bill for the government itself to subscribe for the entire new addition of ten million dollars to the capital stock of the Inland Waterways Corporation show that what has already been done by the government in its operation of the service for about six years prior to the creation of that corporation and by the corporation itself in the four years which have since elapsed, has not succeeded in the declared purpose of the government in attracting private capital to the enterprise?

We further inquire: Inasmuch as the transportation service on which the public is principally dependent and on which it must continue principally to rely is furnished by the railroads, should not the effect upon railroad service of unregulated competition by a subsidized government agency be given serious consideration and should not the problem be determined whether or not it is in the public interest that important competition, subsidized and sustained at public expense, with these essential railroad transportation agencies, should be indefinitely maintained and further extended?

We further inquire: Whether it is in the public interest that the consequent depletion of railroad revenues created by this unregulated and subsidized competition, which reaches out into the vital fields of supply of railroad traffic, should be made up by increased charges on other traffic, or whether, if this is not done, the public is to suffer impaired rail transportation facilities?

We further inquire: Since the railroads are facing these inevitable questions, is not the important question thus raised whether or not transportation on inland waterways should or should not be regulated as the railroads now are, both as to charges and as to service?

In order to settle the important question still in the mind of Congress as to the attitude private capital will ultimately assume toward the service, it is manifest that the operations of the government must be conducted under the same conditions as to regulation and otherwise, and subject to the same charges as would apply to private ownership and operation. Subjecting inland water transportation to the same charges involves, if the real conditions are to be known, a careful ascertainment and setting up by the government of those charges that private capital would be obliged to incur, such as—

a. Taxes,
b. Interest charges,
c. Return on investment, and
d. Adequate depreciation reserves.

It appears to us, therefore, that this present proposal to make this large additional investment from the public treasury in transportation on the inland waterways involves a careful consideration of the question whether or not the service can stand the test of economic justification. This question can not be determined in the absence of complete knowledge of all the pertinent facts. We do not know these pertinent facts. We believe that the committee does not know them, or if they do know them, they have not yet been disclosed. The public certainly does not know them.

We, therefore, urge upon this committee that before additional appropriations are made and further commitment of the government in water transportation service, competing with private enterprise by rail, there should be set up a proper governmental system of regulation through the Interstate Commerce Commission.

We further urge that before additional appropriations and further commitments of the government in this direction be made, there should be an authoritative ascertainment of the facts with respect to the entire cost, and other aspects, of this experimental transportation service, with a view to determine whether or not, under the operating and other conditions applicable to private capital, the enterprise can be made successful.

We urge upon this committee also that if this experimental demonstration is operating at a loss, it is the committee's duty and responsibility not only to ascertain the amount but also to inform the public fully with respect thereto, before additional appropriations and commitments are made.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended March 31 amounted to 950,249 cars, a decrease of 36,213 cars as compared with loading in the corresponding week of last year and an increase of 21,946 cars as compared with 1926. Decreased loading of coal and miscellaneous freight accounted for the greater part of the decline in the total as compared with a year ago. The falling off in other commodity classifications was relatively slight and loading of grain and grain products and livestock continued higher than last year. Coal loading amounted to 151,152 cars, as compared with 174,709 cars a year ago.

Loading in the Southern, Northwestern and Southwestern districts was larger than in the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week ended Saturday, March 31, 1928

Districts	1928	1927	1926
Eastern	216,545	229,394	228,102
Allegheny	191,846	209,799	192,543
Pocahontas	48,349	57,186	46,305
Southern	163,369	163,070	157,009
Northwestern	118,104	116,670	110,206
Central Western	133,734	135,006	125,402
Southwestern	78,302	75,337	68,736
Total Western Districts	330,140	327,013	304,344
Total All Roads	950,249	986,462	928,303
Commodities			
Grain and Grain Products	43,486	37,500	37,632
Live Stock	27,481	26,926	21,364
Coal	151,152	174,709	156,917
Coke	10,243	12,072	12,952
Forest Products	68,459	70,832	73,415
Ore	8,431	11,351	12,174
Merchandise L. C. L.	262,314	263,989	262,142
Miscellaneous	378,683	389,083	351,707
March 31	950,249	986,462	928,303
March 24	950,428	1,003,536	967,945
March 17	942,086	1,001,932	977,018
March 10	951,553	1,000,754	967,425
March 3	959,537	989,863	965,009
Cumulative total, 13 weeks	11,791,270	12,541,125	12,169,728

The freight car surplus averaged 345,272 cars during the period ended March 23, as compared with 340,195 cars on March 15. The total included 165,797 coal cars, 130,600 box cars, 25,319 stock cars and 12,576 refrigerator cars.

Car Loading in Canada

Cars of revenue freight loaded at stations in Canada for the week ended March 31 totalled 61,361 cars, a decrease from the previous week of 3,013 cars and a decrease from the same week last year of 870 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 31, 1928	61,361	41,978
March 24, 1928	64,374	42,151
March 17, 1928	65,107	45,422
April 2, 1927	62,231	41,566
Cumulative Totals for Canada		
March 31, 1928	818,148	516,151
April 2, 1927	790,756	507,590
April 3, 1926	712,638	482,733

THE RAILROAD INSURANCE ASSOCIATION (80 Maiden Lane, New York City) reports having paid fire losses on railroad property in 1927, aggregating $1,945,763; and 371 of the 1,549 fires covered in this report are classified as "cause unknown." The items in which the total loss was over $40,000 are: Overheated stoves, flues, etc., 35 fires, $78,348; defective electric wiring, 22 fires, $41,810; sparks from locomotives, 104 fires, $114,318; careless smoking, 83 fires, $107,337; matches, 18 fires, $166,440; fire on adjacent property, 145 fires, $163,609; incendiarism, 29 fires, $126,973; train wrecks, 40 fires, $256,714.

Railways Ask that Waterway Competition Be on Fair Terms

WASHINGTON, D. C.

THE attitude of the railways toward proposals to continue and extend the "experimental" barge line service now being operated by the government Inland Waterways Corporation on the Mississippi river and its tributaries, through additional appropriations from the Treasury, was stated before the House committee on interstate and foreign commerce on April 6 by Dr. C. S. Duncan, economist of the Association of Railway Executives, and Alfred P. Thom, vice-chairman and general counsel of the association.

Testifying on the Denison bill to increase the capitalization of the Inland Waterways Corporation from $5,000,000 to $10,000,000 with a view to the extension of its service, the representatives of the railways told the committee that the roads have offered and are offering no opposition to federal expenditures for improvements on the inland waterways nor to the experimental demonstration now being carried on under the provisions of the Act to Create the Inland Waterways Corporation as they understand them and their purpose. They are not opposing the development of any form of transportation that the public wants, but, before additional appropriations are made and further commitments of the government in this direction are made, they urge that there should be an authoritative ascertainment of the entire cost of the service under conditions applicable to private enterprise and that if it is to be conducted in competition with the railways that it be subjected to regulation by the Interstate Commerce Commission.

An abstract of Dr. Duncan's prepared statement is published separately.

Dr. Duncan, after reading his prepared statement, also urged the committee to give careful consideration before adopting such a far-reaching proposal as that contained in an amendment suggested by Gen. Thomas Q. Ashburn, chief executive officer of the waterways corporation, which would authorize the Interstate Commerce Commission to issue certificates for waterway operation and require all connecting common carriers and their connections to join with the water carriers in through routes and joint rates, to minimum differentials under the all-rail rates for the water rates, and to establish divisions of the joint rates if the carriers are unable to agree.

Representative Denison replied that he had made the optimistic estimate that the barge line could demonstrate its success in five years but that it had not had a fair trial because the railroads had not co-operated with it in establishing joint rates and divisions. He asked if, in view of the failure of the railroads and the barge line to agree on these matters, legislation did not seem necessary. Dr. Duncan replied that there was a feeling that the barge line had shown a great deal of impatience in working out such questions and that it was asking not only a subsidy from the government but a subsidy of traffic from the railroads, by asking them to short-haul themselves on traffic they are now carrying in order to turn it over to the barge line. If that is the purpose of the legislation, he said, it ought to be made known, because the advocates of an extension of the government service argue that the barge line will create traffic which will redound to the benefit of the railroads. If the five-year estimate was an error, he said, and if the line can be made a success only by taking traffic away from the railroads, the question arises as to how much longer it is proposed to continue the "experiment."

Representative Denison said he did not want to hurt the railroads but that railroad men say the traffic of the country will double in ten or fifteen years and that railroads ought to cooperate with the barge line. He said the policy of the bill was that the experiment had not gone far enough yet to demonstrate the possibilities.

Dr. Duncan then said that if that is so the experiment should be conducted in such a way that it will mean something. He said he had no objection to the way the books are being kept but that they do not show what the operation would cost a private enterprise, and that if the water transportation service is to be developed as a competitor of the railroads it ought to be subjected to the same kind of regulation.

Mr. Thom made a brief statement of the attitude of the railways, saying that they believe the public's right to any agency of transportation it wants must be respected and that all the railways ask is that the terms of competition shall be fair and not such as to impair the existing transportation system. He also pointed out that although the law relating to the establishment of joint rates on through routes by railroad does not require one road to short-haul itself in order to give up traffic to another, the law relating to waterways requires the rail carrier to give up its traffic to the water carrier if the commission so directs.

He pointed out that the recent estimate of the additional traffic available to the barge line if it was equipped to handle it would involve approximately 75 billion ton-miles, which, if taken from the railroads, would amount to $75,000,000 of revenue. Congress should realize the extent of the problem, he said, because it may involve the transfer to the waterways of enough traffic to impair the efficiency of the railways or result in increased rates on their remaining traffic.

"We are not opposing the development of any system of transportation that the public wants," he concluded, "but we ask that the consequences be carefully studied by the committee, because if this experiment is to go on for 25 years it may result in very serious inroads on the revenues of the railroads."

The amendment proposed by General Ashburn follows:

Any person, firm or corporation engaged or about to engage in conducting a common carrier service upon any of the navigable waterways of the United States, their tributaries or connecting waterways, may apply to the Interstate Commerce Commission and upon a hearing and a showing as required under section 1 of the act to regulate commerce, obtain a certificate of public convenience and necessity, and the Interstate Commerce Commission shall within 90 days of the date of such application by order direct all connecting common carriers and their connections to join with such water carrier in through routes and joint rates with reasonable rules, regulations and practices, and the Commission shall in such order fix reasonable minimum differentials between all-rail rates and joint rates in connection with said water service to apply until changed by order of the Commission; except that said joint routes, rates, rules, regulations and practices may be changed by mutual consent of the water service and the other participating carriers. The Commission shall further require the interested common carriers to enter into negotiations for the purpose of establishing equitable divisions of the aforesaid joint differential rates within thirty days after such joint rates are established and if the carriers are unable to agree upon equitable divisions within ninety days from date of publication, then the Commission shall by order determine and establish reasonable divisions based upon the relative value and cost of the service as well as the needs of the individual carriers, to become effective coincident with the effective date of the joint rates; provided, that the above mandates shall apply to the inland waterways corporation in precisely the same manner as if it had been issued a certificate of convenience and necessity, and that if the Inland Waterways Corporation sells or leases its transportation facilities or any part thereof to any person, firm or corporation to be operated as a common carrier, it shall not be necessary for such person, firm, or corporation to apply to the Interstate Commerce Commission for such certificate of public convenience and necessity in order to operate the facilities so purchased or leased; and all through arrangements and joint tariffs with rules, regulations and practices in connection therewith published by the Inland Waterways Corporation and filed with the Interstate Commerce Commission and participated in by other carriers, shall remain in full force and effect between such carriers and the person, firm or corporation purchasing or leasing any part of the transportation facilities from the Inland Waterways Corporation and operating the same as a common carrier, until changed by order of the Commission, except that said through traffic arrangements and joint tariffs with rules, regulations and practices therewith may be changed by mutual consent of said water carrier and the other participating carriers.

Grand Trunk Western Equips Fireless Enginehouse at Chicago

Direct steaming installation has eliminated smoke and produced operating economies

THE elimination of smoke at engine terminals in thickly populated districts is a problem which is demanding considerable attention at the present time. A recent installation of direct steaming equipment at the Elsdon engine terminal of the Grand Trunk Western, located within the limits of the city of Chicago, has resulted in the almost complete elimination of smoke and has actually created a fireless enginehouse.

The Elsdon terminal handles passenger, freight and yard power and despatches an average of about 35 locomotives each 24 hours. The enginehouse has 23 stalls and since it was originally built about 1885, has had the stalls remodeled from time to time to accommodate modern power. In the conversion to operation with direct steaming the smoke jacks have been omitted.

Under present operating methods the fires on all locomotives are dumped at the inbound ash pit before the engines are taken into the house. Unless a boiler is to be blown down for washout or repairs the locomotive is immediately placed on the line and the steam pressure held at 150 lb. or more until called for service when it is moved out of the house under this pressure, and fired up outside. It has been found, after several months experimenting, that when the engines leave the house under 150 lb. pressure or more, they can be fired up with but a very slight trace of smoke.

The sizes of the locomotives handled at this terminal range from the 0-8-0 type switchers, the boilers of which hold about 1,800 gallons of water to the second gage, to the 4-8-4 type passenger locomotives which take over 4,000 gal. to fill to the second gage. The average Mikado type locomotive handled at Elsdon terminal takes about 2,500 gal. of water to fill the boiler to the second gage. On an average only about three locomotives are blown down, refilled or washed out each day, the rest being held under steam.

The System Expedites Despatching Locomotives

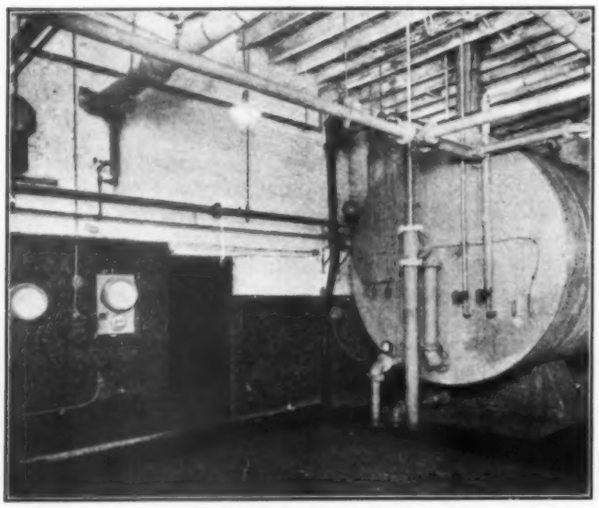
Contrary to the general belief, the system has expedited the despatching of locomotives and has effected economies which were not anticipated. Owing to the elimination of smoke, gases, noise and steam from popping safety valves, the roar of the old type blowers and the smoke and soot in cabs, the working conditions for the enginehouse employee have been improved so that they are comparable with those of the back shop. This has resulted in the removal of many conditions that were objectionable from the employee's standpoints and a decided improvement in the appearance and attitude of the men is noticeable. Some of the older employees stated that they had never expected to work in an enginehouse under such pleasant conditions.

Probably the most important tangible saving effected has been that of locomotive fuel. It is however worth

Locomotive at the Fire Lighting Station

Ten Minutes Later, All Ready to Go

while noting that while the enginehouse is equipped with an indirect heating system it has not been used so far this winter. Although the outside temperature has been below zero on several occasions the interior



The Hot Water Storage in the Pump Room

of the house is said to have been comfortably warm at all times. This condition is due to the fact that there are from 15 to 18 engines under steam in the house all the time and the removal of the smoke jacks makes it possible to retain the heat in the house.

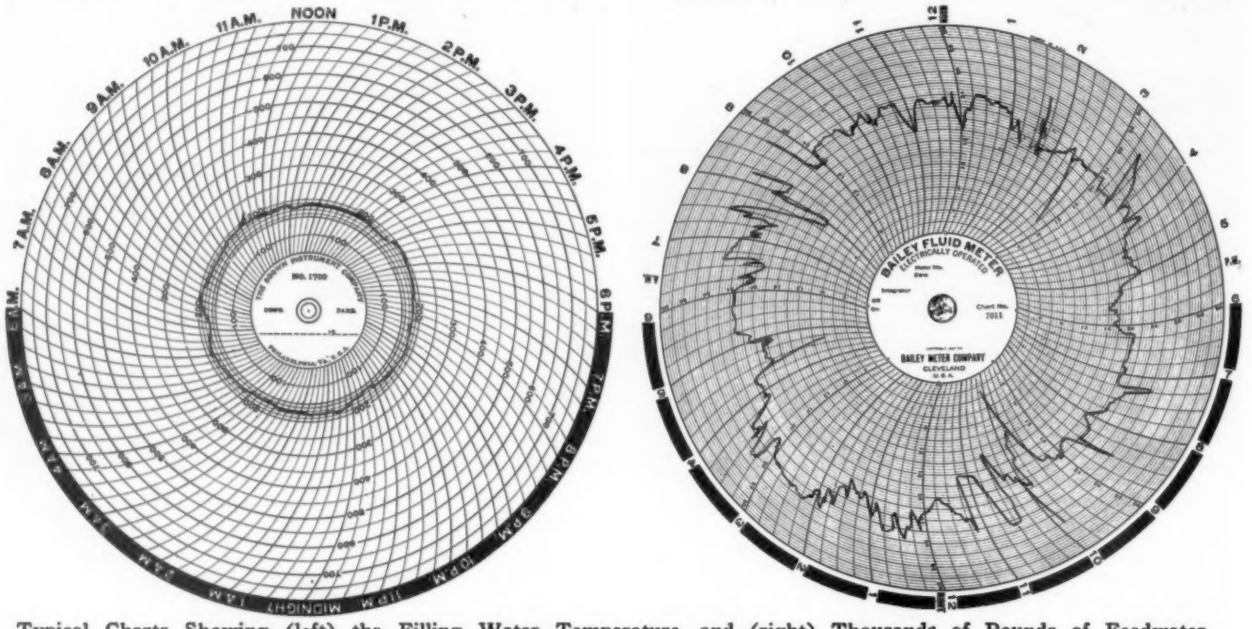
Terminal Consumption of Fuel Reduced

In order to determine the savings effected by the installation of the direct steaming equipment a series of tests were made to obtain the cost of handling power in the old way. So many variable factors enter in that it is not desirable to attempt to give specific figures relating to these tests. A summary of the tests will give an idea of the possibilities of future operation. To obtain the cost of holding locomotives under steam, as for emergency service, tests were conducted with a U. S. R. A. light Mikado, the engine being fired by hand and held at approximately 150 lb. steam pressure for 24 hours. The results indicated an average fuel consumption of 375 lb. of coal an hour. To determine the amount of coal required to fire up a similar locomotive from fill-up water at a temperature of 125 deg. F. to 150 lb. gage pressure, test results indicated that 2,885 lb. of coal were required. Assuming that the locomotive was in the house for eight hours, the coal required per hour would be 356.9 lb. To handle the same type of locomotive with direct steaming would require 112.5 lb. of coal an hour, indicating a saving under the direct steaming system of about two-thirds of the locomotive fuel used in the old style engine terminal. It appears from results obtained so far that with the direct steaming of locomotives there should be an extension of the life of the enginehouse itself due to the elimination of smoke and gases with a resultant lower cost of building maintenance, as no smoke jacks are required.

Description of the Installation

The system was designed and licensed by the Railway Engineering Equipment Company, Chicago, in cooperation with the railroad company's engineers and installed by the National Boiler Washing Company, contractors, Chicago. It is known as the direct steaming system whereby the locomotives are supplied with steam from a stationary boiler plant through the medium of flexible connections at each stall.

After leaving the cinder pit, where the fires are dumped, the locomotive proceeds under its own steam to the enginehouse stall where it is immediately connected to the power plant supply through an extra heavy 2-in. flexible copper hose and a ½-in. steam line which holds the pressure to within a few pounds of that of the stationary plant. After boiler and fire box inspection, 90 scoops of coal are distributed evenly over the grates. All operations, such as testing air pumps, headlight generator turbines, and injectors, can be made under power plant pressure and with comfort to the workmen.



Typical Charts Showing (left) the Filling Water Temperature, and (right) Thousands of Pounds of Feedwater per Hour to the Stationary Boilers

If boiler work is required the boiler is blown down

in a manner similar to the blowoff for a hot-water washing system. The latent heat and steam are used to heat the fill-up water. When the boiler work is finished the boiler is filled with steam for a few minutes, to equalize the temperature, after which water at 180 deg. F. and stationary boiler plant steam are admitted at the same time, resulting in from 10 to 15 lb. pressure in the boiler by the time the water appears at the bottom of the water column. The water is then turned off and steam alone allowed to build up the pressure. This operation of filling and steaming requires approximately 30 minutes, depending entirely on the steam available and the temperature of the fill-up water. After the pressure has been raised to the desired point

Direct Steaming Connection to the Locomotive from the Overhead Piping in the Enginehouse

the large 2-in. steam boosting line is closed and the ½-in. steam line turned on for holding the engine under steam until despatched. All of the above operations are accomplished with but one flexible copper pipe connection to the blow-off cock, which can be attached very quickly. The control valves are mounted on overhead pipe lines and are operated by extension handles within easy reach of the floor.

Prior to despatching the locomotive the 2-in. booster line is opened while the air is being pumped up, assuring a full head of steam and air for the movement to the fire-up track.

After leaving the enginehouse the locomotive is delivered to the fire-up track. Here fuel oil and air stations are installed to which fire-up torches are attached. The torch is of the syphon type, the oil pressure being only a few ounces, with air at approximately 100 lb. pressure. Five or six minutes are usually required to ignite the fuel bed, after which the locomotive is ready for movement to the train yard. The time intervening between firing and coupling on to the train has been found sufficient to give the fireman plenty of time to have the fire in good condition for handling a train. The success of despatching depends largely upon the steam pressure on the boiler at the time of firing. Low steam pressures result in poorly ignited fires and considerable smoke.

The Power Plant

Because the power plant is the heart of the direct steaming system, it was necessary to install high pressure boilers. The plant consists of two 300-hp. 200-lb. bent tube boilers set in one battery. The boilers are fired by chain grate stokers, a feature of the stokers being individual engine drive with two speeds through gear reduction, eliminating the old style line shaft. Coal is dumped on an elevated structure and fed automatically to a chain bucket conveyor which feeds independent hoppers for each boiler. From storage hoppers the coal is fed by gravity to the stokers. The ashes are dumped into a pit under the stokers and removed by a steam ash ejector into a hopper feeding directly into cars outside of the plant.

Dispatcher Signaling System Operates Through Sleet Storm

A heavy sleet storn in northwestern Ohio on March 29 and 30 broke down hundreds of telegraph poles along the railways in that area, including over 600 poles on the New York Central lines in that vicinity, about 200 of which were on the 40-mile installation of the centralized dispatching system extending from Berwick to Stanley. In spite of the loss of these poles no delays to trains resulted on this line because of any shortcomings of the dispatching system, notwithstanding the fact that all other communication and facilities for directing train movements were out of commission. This storm subjected the dispatcher signaling system, installed last summer by the General Railway Signal Company, to an operating test beyond anything anticipated at the time of its installation. All control wires are carried in Hazard steel-armored cable which did not break the circuit continuity at any point, despite the pole line failure.*

The storm extended over an area from Toledo, Ohio south to Sycamore, about 55 miles, and from Ft. Wayne, Ind., east to Lima, Ohio, about 59 miles. Ice began to form on the wires about 9 p.m. on March 29 and at 11 p.m. the regular telephone and telegraph wires began to break, so that all communication was lost. About 3 a.m. the ice became so heavy that poles were broken down and by morning over 200 poles were down on the Ohio Central Lines between Toledo and Berwick. A total of 600 poles were destroyed on the New York Central alone in this entire area before the storm subsided. At 4 a.m. a high-tension pole of a power company fell across the tracks at Norris, Ohio and rail-

* A description of this system of centralized dispatching was published in the *Railway Age* for August 20, 1927, page 325.

road poles fell across the tracks just north of Fostoria. Trains were, of course, delayed until these poles were removed, following which operation continued as usual.

Method of Operation

Although the dispatcher lost his regular telephone dispatching and other communication circuits at 11 p.m., he continued to line up the levers for trains which were due to enter the dispatching territory. He had no means of knowing when a train was due to enter his territory until he received the automatic "OS" at the entering section.

He then directed the train by signal indication in the normal manner. No unusual trouble was occasioned by ice preventing the operation of the remote power switches.

Two trains, No. 45 and No. 46, of the Big Four (the Flamingo) were handled over the territory without delay and, in fact, made a non-stop meet at Wayne, Ohio. The dispatcher's report included a statement that the trains could not have been handled in this sleet storm with the old method of train orders and that the new dispatching signal system kept the road in operation in spite of the sleet storm.

The average daily traffic on this division includes 12 passenger trains, 11 freight trains and 1 local train, or a total of 24 trains. The Western sub-division of the New York Central from Toledo, Ohio to Columbus was

Five-Inch Icicles Formed on the Wires, Causing Over 600 Poles to Go Down

also affected by the sleet storm, the pole line being torn down and communication lost between Bowling Green, Ohio and Dunkirk. This line was not restored until 6 p.m., April 1, and in the meantime, several of the trains ordinarily run on this line, were detoured over the Eastern sub-division via Berwick and Toledo, which increased the movements over the centralized dispatching territory about three or four trains a day.

Why the Dispatching System Continued in Operation

With the centralized dispatching system, train movements are directed by signal indication without written train orders; therefore, communication to intermediate stations is not required for through movements. Although over 200 poles went down under the ice load between Toledo and Berwick, the control wires of the dispatching system, which are in cable, were not broken. The cable was especially designed with steel-tape covering to make it bullet proof and was installed with 7/16-in. messenger to withstand any sleet storm. Although this storm was more severe than anything anticipated, the remarkable strength of the cable emphasized the merits of this type of construction. The alternating-current power supply is fed to this system at four points. Although the sleet storm tore down the power company's lines to three of these substations, the dispatching system was automatically cut over to the storage battery reserve provided for such an emergency.

Signal Location in Sleet Storm Area—Note Pole Line Down at Left of Track

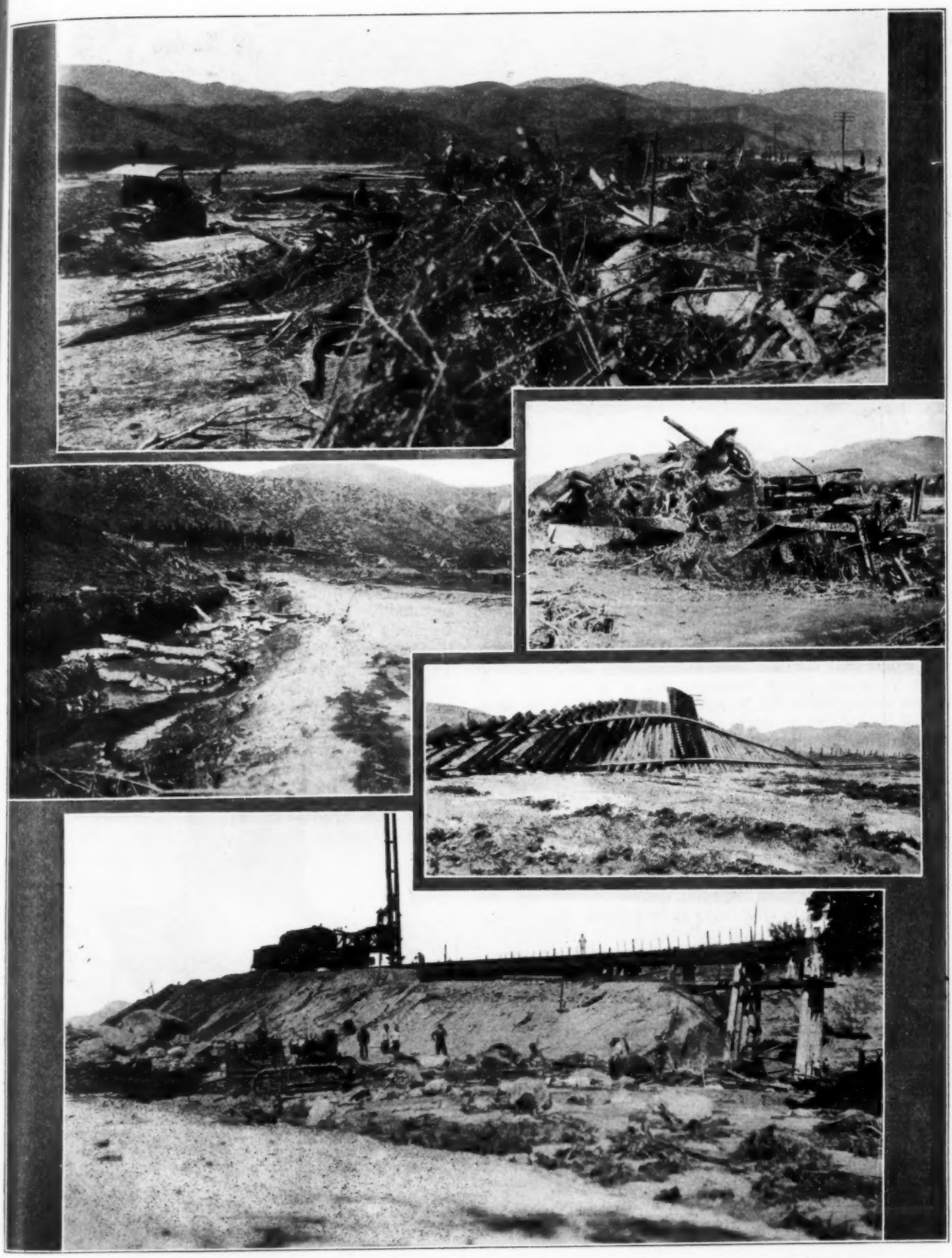
Telephone service was not restored on the section from Berwick to Sycamore until 3:50 p.m., March 31. The dispatcher's telephone circuit was not restored between Fostoria and Toledo until 6 p.m., April 1, and it will be several weeks before the pole line is rebuilt.

The storm extended south of the centralized dispatching territory from Berwick to Sycamore about nine miles. This territory is operated normally by time table, train orders, and manual block. In this area, train wires were lost about 11 p.m. on March 29. Trains were then operated on time-table rights when running on schedule but otherwise a flagman preceded each train through the dead section. Serious delays, of course, occurred which indicated what would have happened if the centralized dispatching system had not been in service throughout the major portion of the sleet area.

* * *

Ewing Galloway

Great Southern (Ireland) Station at Portarlington



St. Francis Dam Failure Results in Severe Damage to Southern Pacific Line

Damage to the roadbed and bridges of the Saugus-Montalvo branch of the Southern Pacific totaled $250,000. Not only were long stretches of track washed off the roadbed as shown in two of the center views, but much expense was also incurred in clearing the roadbed of debris. This was principally brush and trees, but one view shows the wrecks of five motor trucks piled on top of a gondola car. Caterpillar tractors proved of marked assistance in clearing away debris, handling materials, etc.

Two-Unit Gas-Electric Car Which Is Operated on the New York Central

Gas-Electric Unit for Rail Cars

High compression, compact engine operated at full torque at varying speeds—Cooling system and electrical control carefully worked out

COMPACTNESS without sacrifice of availability, operation at full throttle and open governor at a wide range of engine speeds, interchangeability of the unit and unique electrical control, are the important features of the gas-electric unit designed and put in service by the Mack International Motor Company, Plainfield, N. J. The equipment has been designed for use in three sizes of rail motor cars and three sizes of locomotives. It also has been installed in a motor coach. A single-unit car has been in operation on the line of the Winnipeg River Railway, and a two-unit car has been in service on the New York Central in the Adirondack Mountains in northern New York. These cars are shown in the illustrations.

Construction of the Base

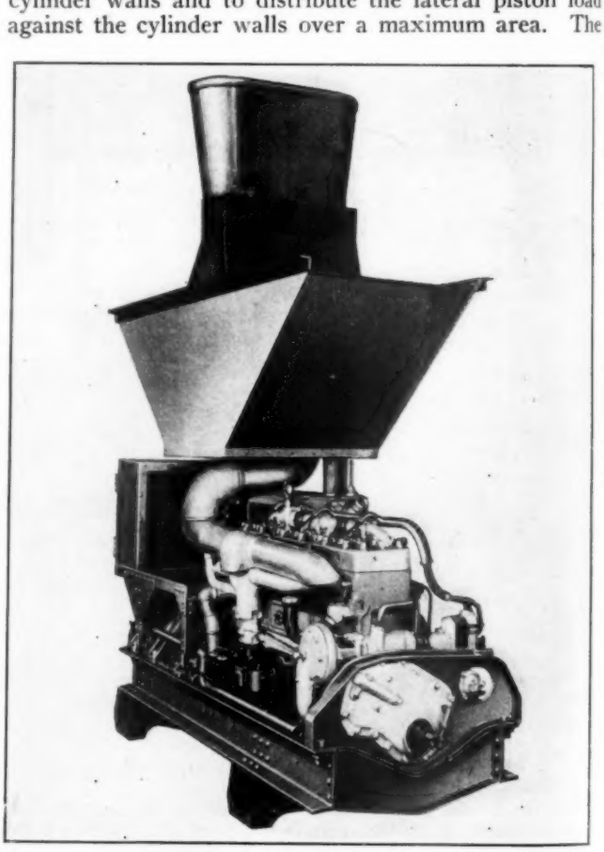
The engine and generator, together with all auxilliaries, weighs 5,700 lb. It was important that this weight be supported on a base that would provide rigidity and proper alinement. The conventional cast base did not prove satisfactory as it is subjected to warping, which prevented proper alinement and did not provide accessibility to the crank case. As shown in the illustration, a base constructed of channels was finally adopted. This design permitted the removal of the crank case and generator without the necessity of removing the unit from the car. It also provided greater rigidity and made possible accurate alinement.

The unit rests on four rubber cushions for the purpose of absorbing the engine vibrations and to relieve the impact caused by starting and stopping and coupling cars. These rubber cushions, shown in one of the illustrations, each consists of two rubber blocks held in compression between two metal plates by two bolts. Each bottom base plate is bolted to the car floor. The power unit base pad rests on the lower rubber block and the second rubber block rests on top of the pad. The whole is locked in position by two bolts, the castellated nuts of which are tightened against ball joint washers, permitting universal angular movement of the bolt. The floating bolts and rubber blocks not only absorb vertical vibrations, but also horizontal end thrusts imposed on the unit.

Features of the Engine

The six-cylinder Mack AP model engine used, has a 5-in. bore and 6-in. stroke with a total piston displacement of 707 cu. in. Referring to the power curve chart, at 1,350 r.p.m. the engine develops 125 brake horsepower and at 1,800 r.p.m., 152 brake horsepower. At 1,350 r.p.m., 103.5 lb. brake m.e.p. is attained, which is considerably higher than that customarily attained from automotive gasoline engines. This output is obtained by using the average grade of gasoline.

The piston heads are made of aluminum and have long skirts to provide for adequate lubrication of the cylinder walls and to distribute the lateral piston load against the cylinder walls over a maximum area. The



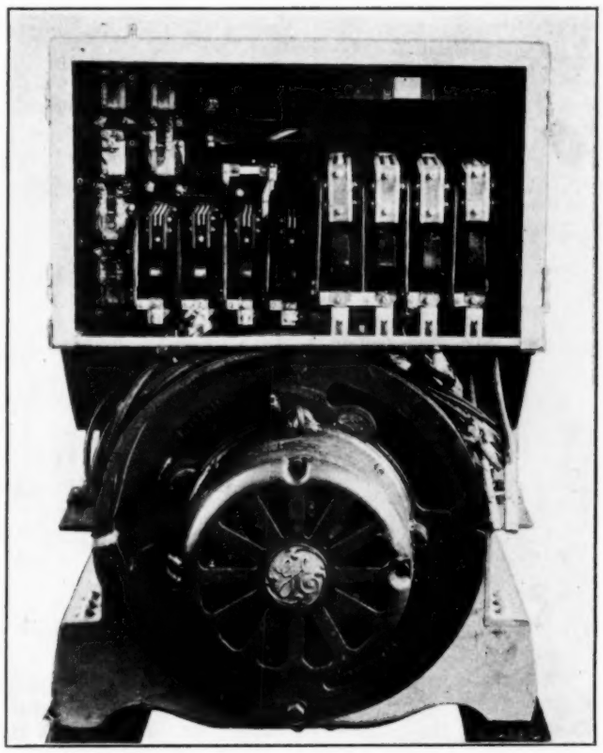
The Unit with the Educator in Position

connecting rods are of tubular construction machined all over. This design was adopted to provide adequate strength with light weight and to facilitate close balancing. The cast-in-block cylinders are provided with three aluminum cylinder heads, one for each pair of cylinders. Aluminum was used primarily to effect a rapid transfer of heat to the jacket water. The inlet valves are of chrome-nickel steel, 2 1/16 in. in diameter and the exhaust valves of chrome silicon-steel, 1 15/16 in. in diameter. The 3¼ in. diameter crankshaft constitutes 300 lb. of the total engine weight of 1,800 lb.

The electrically controlled 2-in. standard carburetor draws fuel from a 110 gal. tank located underneath the car. A pressure of 5 lb. is constantly maintained on the fuel supply. Each unit has its own fuel tank which can be cut out in an emergency. Each tank is provided with a protector seal which will open in case of excessive pressure. An automatic magneto spark advance operates in conjunction with the carburetor.

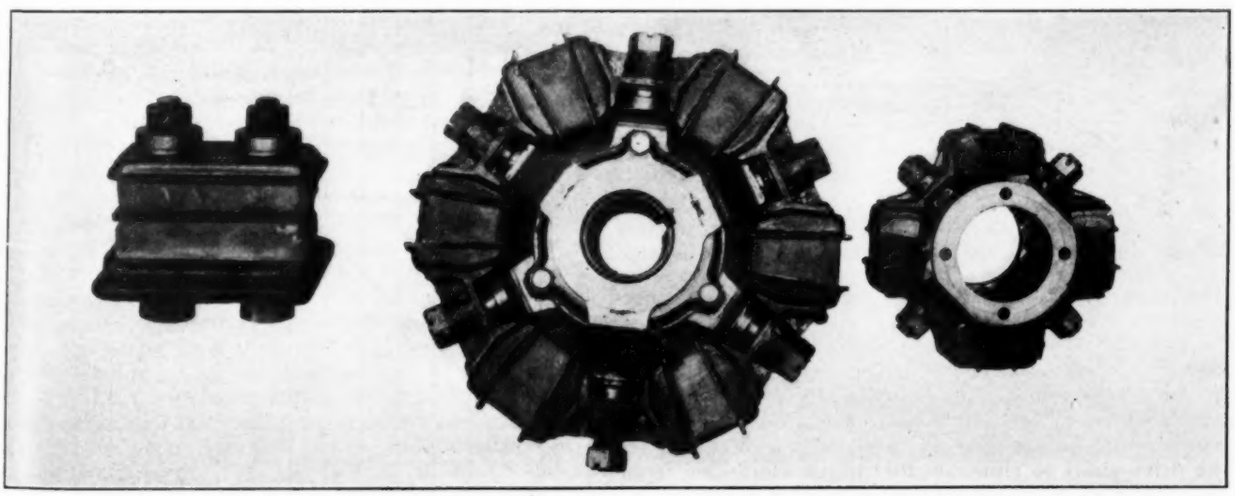
The Cooling System

The cooling system is a combination of celular radiators inside the car, an air eductor and roof radiators. The drain tank, indicated in the drawing showing the cooling system, holds 20 gal, of water, and is a part of the power plant unit. The water pump forces the water through the engine jacket, up through the roof radiators and then through the radiators in the air eductor stack from which it drains back into the tank. The air eductor stack consists of two sets of venturi-shaped stacks, located between the two radiators, all enclosed in a sheet aluminum housing. The partitions are filled with sound-deadening material. The engine exhaust, which is delivered through two outlets just below the two sets of draft pipes, in passing through the pipes produces an ejector action similar to the action of the exhaust in a steam locomotive when it enters the stack. A gas chamber shown at *F* on one of the photographs is attached to the exhaust manifold to smooth out the exhaust pulsations, and this has materially assisted the insulated eductor walls in muffling the sound of the exhaust, without building up back pressure. The air enters the eductor stack through the hood-shaped opening at the front of the car, passes down through the two celular radiators and up out of the stack through the draft pipes. One eductor stack is provided for each unit and has a capacity of 6,500 cu. ft. of air a minute.



Front View of Panel Box Showing the Compact Arrangement of the Apparatus

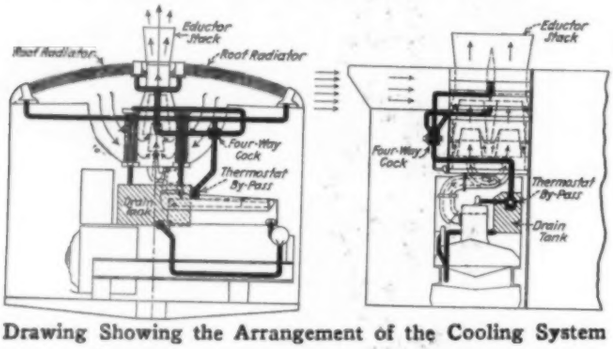
The cooling system maintains a water temperature of 160 deg. F. all the year. No anti-freeze solution is ever used in the water. In the winter, the roof radiators are cut out by the four-way cock shown in the drawing. This allows the use of only the radiators in the eductor stack. Another protection against freezing is that when the engine is idling, owing to the lack of water pressure from the pump, the water drains from the roof and eductor stack radiator into the drain tank. If the water passes out of the jacket below a temperature of 160 deg., it is by-passed back into the jacket and



Left: One of the Four Rubber Blocks on Which the Unit is Supported—Right: The Rubber Torque Insulators Used Between the Engine and Generator and in the Air Compressor Drive

not pumped into the radiators. This is made possible by the thermostat by-pass control located just outside of the drain tank.

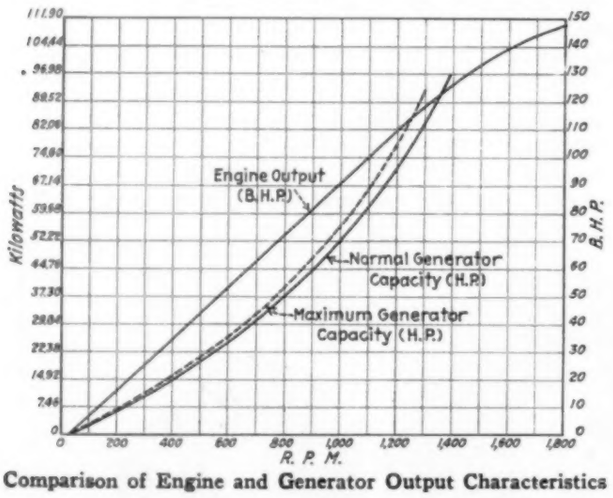
Another interesting feature is the location of the motometer. It is located directly on top of the cylinder head, thus eliminating a long pipe and connection to



Drawing Showing the Arrangement of the Cooling System

the operating cab. This gage has two electric wires which lead to a red light in the cab. The contacts are set to close at 200 deg. F. causing the light to show on the panel board in front of the operator. On this indication he immediatetly cuts out the engine by a switch adjacent to the light.

The lubrication is supplied by a two-pressure oil pump. Here again the oil pressure gage in connected directly into the engine oil line. In addition to the visual gage, a safety gage is provided. This is set so that, should the oil pressure drop to ½ lb., an electrical circuit is closed which also produces a red light on the cab panel, notifying the operator that there is trouble.



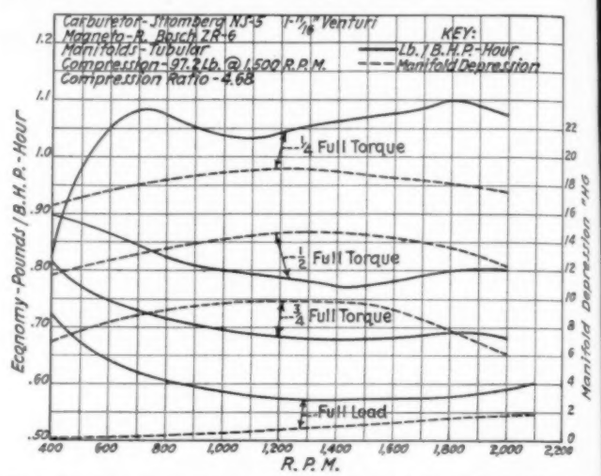
Comparison of Engine and Generator Output Characteristics

The same lamp is lighted by the water temperature and the oil pressure circuits.

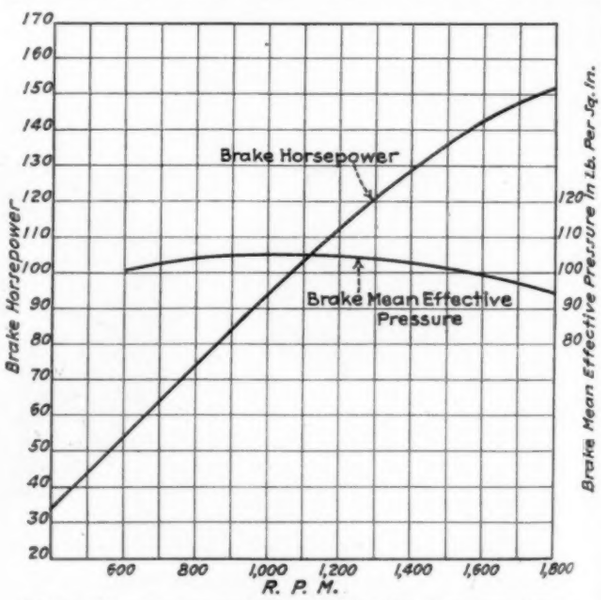
Each unit is equipped with a 12-cu. ft. capacity air compressor, which is gear driven and operates while the engine is idling, thus insuring air pressure at all times. Two fly wheel and a rubber torque insulator, which will take up a 10-deg. rotation, are mounted on the drive shaft to eliminate the torque vibrations from the compressor, and the large fly wheel smooths out the vibrations from the compressor. The rubber torque insulator further smooths out the torque before it passes to the second fly wheel. This rubber torque insulator and the large type used on the generator drive shaft for the same purpose are both shown in one of the illustrations. The larger insulator takes up a maximum rotation of 15 deg.

The Control

Probably the most unique feature of this power plant, considered as a whole, is the type of electrical control which permits the operation of the engine with full open throttle and full torque over a considerable range of speed and power output. The fuel economy curves of the Mack AP engine at various torques and speeds, shown on one of the charts, indicate a much lower fuel consumption per brake horsepower-hour when the engine is operated at full torque over the entire practicable range of speed regulation. Thus, at 1,350 r.p.m., which is the normal operating speed of the engine, the full load fuel consumption is .57 lb. per brake horsepower-hour while at three-quarters full load obtained by throttling increases the unit fuel consumption to .68 lb. per horsepower-hour. On the other hand, should three-quarters of the full load horsepower be developed with a load which would reduce the speed of the engine to approximately 1,000 r.p.m. with a full throttle and



Fuel Performance Curves for Various Drive Shaft Torques



Brake Horsepower and Mean Effective Pressure Curves

full torque, the fuel consumption would be increased only about .58 lb. per brake horsepower-hour.

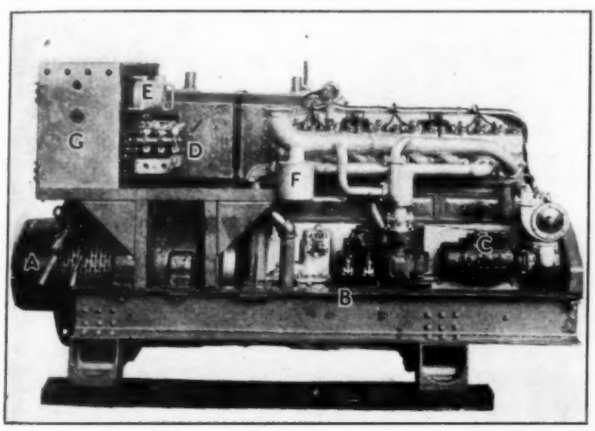
To take advantage of full torque fuel economy as far as possible, the control has been designed so that

when less than full power output is required the operator, by reducing the resistance in the generator field circuit, can cause the generator to overload the engine, slowing it down to a new balancing speed at which the reduced power required will be delivered with a full throttle. Regulation in this manner is possible down to two-thirds of full power. Below this, throttle regulation is necessary.

With the power plant operating at a given speed and corresponding full throttle power output, the inherent regulation of the generator, as the current requirements of the motors vary with changes in the speed of the car, causes the generator load to vary somewhat from the normal output and to unload the engine. By means of suitably arranged electrical contacts on the governor, the tendency of the engine to throttle itself under these conditions is followed immediately by a change in the generator field resistance which offsets the inherent tendency of the generator to vary from the full throttle power output of the engine at the speed under consideration.

Electrical Equipment

The power plant is designed to use either General Electric of Westinghouse electrical equipment. With

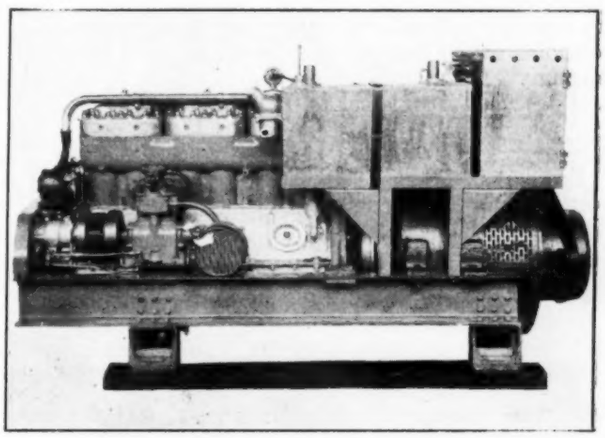


Side Elevation of the Gas-Electric Unit with Important Parts Enumerated—A: Exciter Unit—B: Throttle Control Solenoids—C: 32-Volt Lighting Generator—D: Field Regulating Resistance—E: Receptacle to Receive Cable from Controller—F: Exhaust Gas Chamber—G: Panel Box for Housing Switches and Contactors

the Westinghouse equipment the generator regulation to effect constant power output for varying current requirements is a motor-driven face plate rheostat controlled by the engine governor. With General Electric equipment this regulation is effected by a unique method of automatic control of excitation from the separate exciter to the main generator field which gives full engine loading at all car speeds.

The main generator, with a rating of 95 kw., operates at a speed of 1,000 r.p.m., when reduced power is desired to 1,500 r.p.m. for full power. Compactness of design is apparent from the manner in which the various magnetic circuit controlling devices are mounted in the panel box directly over the main generator. The proximity of this panel to the generator makes it possible to use extremely short leads between the switches on the panel and the generator. The location of the generator itself with respect to the car motors is also such that the circuits between the generator and the motors are extremely short; in fact no heavy current carrying conductors are required other than the regular leads which accompany the generator and motors. The resistance units used to shunt the generator field circuit are conveniently attached to the rear of the panel, and immediately above these is located a receptacle into which is plugged the cable leading to the controller.

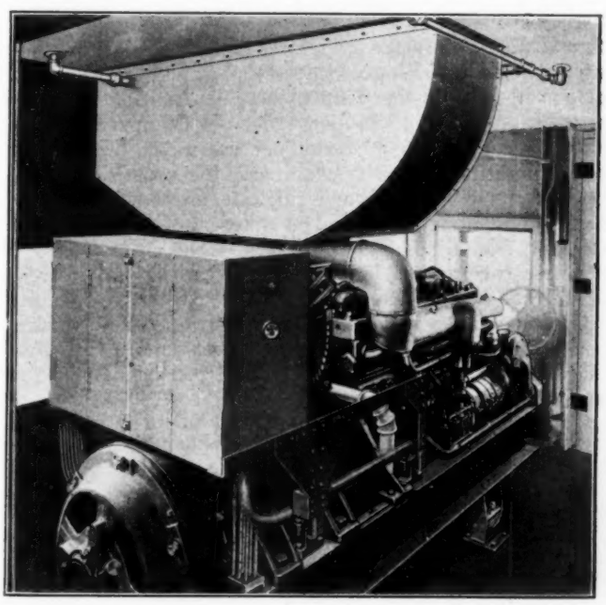
The lighting is accomplished by a 32-volt, 750-watt self-excited generator used in connection with a storage



The 12-cu.-ft. Gear-Driven Air Compressor and the 20-gal. Drain Tank

battery. Voltage regulation is accomplished by means of a differential compound winding doing away with all regulating devices. This generator is driven directly from the gear casing at the front end of the engine.

The entire control of the power plant by the operator is effected with a master controller of the remote control type to which current is supplied at 32 volts to operate the various magnetic switches, which in turn



The Control Panel and the Educator Radiators Are Fully Enclosed

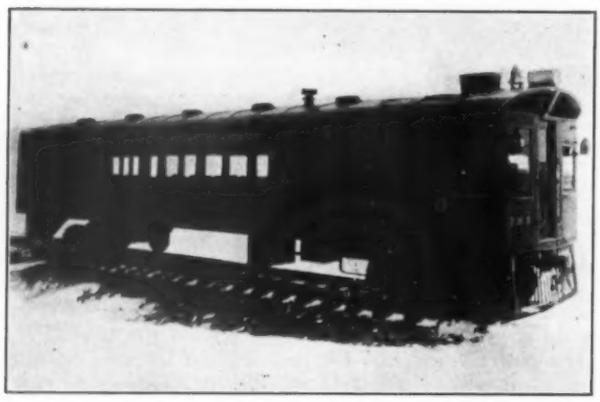
control the heavier current circuits. A number of unique features are built into the master controller which make for simplicity of operation. On the reverser handle provision is made for throwing on the maximum field of the generator, stalling the engine to a

speed considerably under its normal operating speed. Also, in connection with the reverse lever, are contact points which control forward and reverse sanders.

The engine throttle is also operated by the master controller. With the controller handle in the off position, the ignition circuit is open and the engines are stopped. The first notch on the controller causes the generator to function as a starting motor, drawing current from the 32-volt battery. As soon as the engine starts, the battery is automatically cut out and the engine continues to idle. The next three notches operate first one and then the other, and finally both of two solenoids which provide two partial and a full throttle opening. The remaining control functions in the control panel are automatic and balanced.

Operating Data

Power can be supplied to the traction motors at a cost of from three cents to five cents per kilowatt-hour. These figures include fuel, oil, depreciation, interest,



The Single-Unit Car Operated on the Winnipeg River Railway

etc. A single unit car, weighing 63,300 lb. with a seating capacity for 59 passengers, operating at 30 m.p.h. on a schedule of three miles between stations and on an average grade of ¼ per cent, can be operated at a cost of from 27 to 30 cents per car-mile. Under the same conditions for a two-unit car the cost is from 42 to 58 cents. These figures include crew wages based on an eight-hour day for 100 miles and a twelve-hour day for 200 miles.

These care are so built that they can be run in multiple; that is, one engineman can control two or more rail cars from any position in the train. This makes possible the operation of trains of six or more cars with this equipment. Such a train would consist of two rail cars and four coaches.

Tractive Force at Various Speeds from One-, Two- and Three-Unit Cars

Seating Capacity	Weight loaded, lb.	Total Capacity, amp.-hrs.	Generator output	M.p.h.	Tractive Force lb.
	Single-unit car—120 brake horsepower				
57	63,300	150	95	10	3,300
				20	1,700
				30	1,200
	Two-unit car—240 brake horsepower				
77	121,500	300	190	10	6,000
				20	1,700
				30	1,200
	Three-unit car—360 brake horsepower				
72	131,300	450	285	10	10,000
				20	5,100
				30	3,500

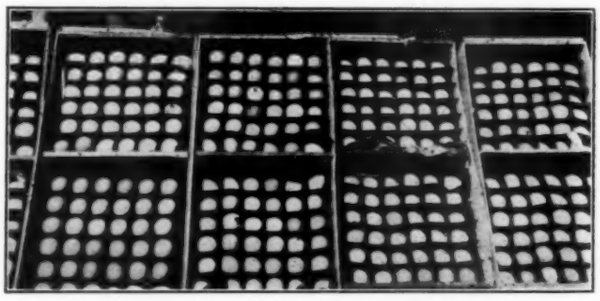
Egg Inspection Sponsors Better Loading and Packing

THE inspection of eggs at Chicago has resulted in improved methods of packing, loading, stowing and bracing, which in turn has brought about a decrease in the damage to this commodity at Chicago. During 1927 the Western Weighing & Inspection Bu-

Excelsior Used at Center and Ends

reau inspected 4,743,767 cases of eggs in straight and mixed carloads and found only 89,348 cases or 1.9 per cent damaged, as compared with 3.1 per cent in 1923, 3.9 per cent in 1924, 2.5 per cent in 1925, and 2.5 per cent in 1926.

This inspection has made possible the determination of the relation between damage and types of bracing. Several types of buffing and bracing were found in carload shipments. Excelsior, hay and straw were used between the cases and the bunkers of the car or at the center for buffing the load. Wooden frames, racks, and



Reused Fillers Cause Broken and Cracked Eggs

wedge frames were used in the center or ends to make a tight load. The results of these methods are as follows:

	No. cars	No. cases	No. cases damaged	Percentage
Excelsior at center or ends.....	1,003	412,499	6,045	1.47
Hay at center or ends.....	1,197	487,730	10,261	2.10
Straw at center or ends.....	6,131	2,479,792	47,789	1.93
Wooden frames at center or ends	919	373,764	6,177	1.65
Wooden racks at center or ends	990	381,056	3,450	0.91

Among the various methods of packing, cup flats with various kinds of cushions show the least amount of damage. A total of 33.68 per cent of the cars or 35.07 per cent of the cases received were packed with the cup flats while the damage occurred in only 0.68 per cent of the cases. A comparison with other methods of packing follows:

	Cars	Percentage of cars received	Cases	Percentage of cases received	Cases damaged	Percentage of damage
Cup flats with various kinds of cushions	4,008	33.68	1,663,412	35.07	11,316	0.68
Standard flats with various kinds of cushions	7,867	66.10	3,068,474	64.68	77,610	2.53

Short Lines Oppose Per Diem Rule 6*

Insist that it is not suited to short lines and suggest a substitute

By L. S. Cass

Vice-President, American Short Line Railroad Association

I THINK the per diem rules and the per diem system as used between trunk line carriers in the interest of trunk line carriers is the best method of handling cars between trunk lines that I have known, but it does not fit the little short lines, the conditions in trunk line operation being so different from those of the short line fellows. For instance, the trunk lines have long-haul traffic and they have switching traffic and they have short-haul traffic. Now, many of the short lines of the country are purely switching railroads. It does not make any difference whether they do business on what is known as a line-haul tariff or whether they do it on a switching tariff. As a matter of fact they are switching railroads. Therefore, they do not have the opportunity to wash out any inequalities in the operation of the per diem rules. The trunk lines can wash those things out. One hand will wash the other. Where the trunk line gets the worst of it in a per diem rule today, at some other point on the line they get the best of it tomorrow, and as a matter of fact many trunk lines get a good deal of use of freight cars free. For instance, on cars delivered to them at a junction point that arrive at a terminal inside of 24 hours, they frequently get free per diem.

Rules Not Suited to Short Lines

As to switching, the trunk line, member of the American Railway Association per diem agreement, gets free time. In other words it does not cost anything for car hire in performing a switching service. As to the little fellows who are not members of the per diem agreement, if they pay the per diem, it frequently takes more for the payment of per diem than they earn on the switching traffic. So that it does not fit the little railroad. There are some short lines that are in that position that they can pick up the car and deliver it within the 24 hours between midnight and midnight and therefore escape per diem, but it is an exceptional situation as regards short lines.

Under the old mileage system, when cars were idle, when they had reached their destination, there was not anything counted against them; there was nothing paid for them. With the per diem system, of course, from the day they get the foreign line car until the day they deliver it to some other fellow they pay a dollar a day. A short line has nothing but short haul. There is not anything they can enjoy but a short haul, and a large part of that is switching service.

The votes of the American Railway Association in per diem rules are per car owner. In other words, it is not by individual roads only as their number of votes is controlled by the number of cars that they control. The short line fellows, many of them, only have an associate membership, which does not give them a vote at all. In fact none of the proposed per diem rules is circulated among the associated members, because it would not make any difference what they think about it, they cannot vote on it anyway. The car owners could agree among themselves to put a per diem rate on the short lines that would take their entire revenue, if the hands of the commission did not stop them.

In years gone by the traffic departments of the railroads would take into consideration the question of car hire and things of that character, but the question of car hire now and per diem and the accounting divisions of the trunk line railroads have become specialized. A traffic man does not want a car hire fellow to tell him what he shall do on divisions, and the car hire fellow does not want the traffic fellow to tell him what he shall do on the question of divisions, and as you get higher up into the chief executives' offices, why, naturally, the president of a big railroad must say "you must take this matter up with my different departments." So that during the last number of years the different departments of railroads have become surrounded by walls, and it takes a good deal to get through those and get to some fellow who will take into consideration all of the elements that surround the particular situation.

Car Hire and Divisions Separate Questions

I think car hire is distinctly a question within itself. I think that whatever is the fair rate to be paid for the use of a car, taking all things into consideration in the territory affected, should stand entirely upon its own bottom. I do not think that the question of divisions enters into what car hire should be or what it should not be, or the method of handling car hire. While it might be possible, over a course of a great many years and following the Interstate Commerce Commission, with thousands of cases probably, to adjust the inequities of car hire to the short line railroads through the revenues and divisions of the revenues, when you attempt to do that you have got to increase the rates, and that is against the interest of the public—you would very soon have the public on your back. It is obviously true that you cannot fix any relief for car hire for a switching railroad that has only a switching tariff, merely by dealing with the question of car hire itself. You cannot do it in the division or increase the rates. It has no division of rates. You cannot increase the rate without taking into consideration what the public is going to say, what the state Commissions are going to say. It is practically an insurmountable obstacle.

Then another case: Many short line rates are made upon an arbitrary over the junction point rate. If you deal with that situation, then you must take what was considered a fair division to the trunk line away from it and give part of that over to the short line, or you must increase the rate of the short line, which is the arbitrary rate over the junction point. In other words, it would not be practicable to take care of those inequalities by a matter of divisions.

Further Increase in Cars Uneconomical

I think the per diem system has had a very material effect in increasing the car supply in this country until it has now reached a point where any further increase would be uneconomical. Of course that is not the only thing that has done that. The question of a greater car capacity, the question of a greater movement per car

* From a Statement at the Hearing at Washington, D. C., on March 27, 1928, in Connection with the Interstate Commerce Commission's Investigation of Rules for Car Hire Settlement, Docket No. 17,801.

per day, the rapidity with which they load and unload cars now over the old arrangement, the more efficient terminal facilities, all of those have entered into the question of the present car supply, which has reached a point now where it is beyond the requirements of the traffic of the country, and any addition to the car supply until the traffic of the country catches up with it would be an undue burden upon the freight rates.

Many of the short line railroads would be unable to put cars into circulation, even if they owned them, under any conditions. Take a road that is predominantly a receiving road. They could not get their cars out onto the trunk line railroads, because they have no loading for them. Therefore it would be inconsistent for them and it would be an unnecessary burden upon the freight rates of this country if money were expended for freight cars to stand idle upon the tracks of a carrier that could not load them out.

Based upon the testimony that I have read that has been taken in this case it costs the trunk line a dollar a day to own freight cars. It would cost the short lines a dollar a day to own freight cars, and if they paid a dollar a day to use freight cars that belonged to some one else, I do not see but what they would be in exactly the same position, so far as their saving the excess cost.

I have made a study of the car situation on the short line railroads that are members of the American Short Line Railroad Association. Out of a mileage of commercial short line railroads in the United States, of around 21,000 miles, there are in the American Short Line Railroad Association 429 member roads that have a total mileage of 15,599 miles. All of those 429 railroads own some freight equipment, or a total of 33,677 freight cars of every character. That is excluding work cars and that character of cars. Of the 33,677 freight cars owned by these 429 railroads, 37,070 are interchangeable freight cars and are listed in the Equipment Register. If those 429 carriers were to own the proportion of freight cars per mile of road that is now owned by the trunk lines it would be necessary for them to own around 11 cars per mile of road, which would increase the number of cars necessary for these carriers to purchase 114,000 freight cars; and including the other lines representing the 6,000 miles which are not members of our organization, it would require around 150,000 freight cars in addition to all that are now owned.

If, then, it costs a dollar a day to own a freight car, here we are up to around $50,000,000 to $55,000,000, which in the last analysis is added to the freight rate burden of this country, and with no benefit whatever to the commerce of the country, and of substantially no benefit to the carriers who would buy them, because, in the first place, they have not got the money to buy them, and in the next place they could not save anything on the cars after they got them. So that it would be very much better, if through some character of hocus pocus these poor little fellows should be able to get money enough to own 11 cars per mile of road—they might a good deal better invest that money in government bonds or real estate mortgages and use the money to pay the car owners for the use of their cars, because there is not any use of having cars standing around the country that cannot be used.

I think that the greatest confusion has been injected into this hearing because the trunk lines are not only car owners but they are car users. It does not make any difference whether a car is owned by the trunk line railroads, by the packers, or by the oil men, it is an instrumentality of transportation that ought to be paid for on a fair rate, that is, the cost of the car. Just divorce for a moment the question of the trunk lines owning cars and say that there are cars in existence that have cost some $1,000 or $2,000 or $2,500; they cost somebody that.

What should be found, it does not make any difference who furnishes it, is the proper part of the use of that instrumentality that should be paid by each of the users for the entire distance that the car travels. It does not make any difference who owns the cars. What is the fair price to pay for the use of that car for the entire distance it travels and what part of the use of that car shall be paid by the different users that the car moves over from the point of origin to the point of destination? That is really the test of the situation.

I think that the trunk lines have found ways and means to pretty much balance up their per diem account, and I think that the necessity of doing that is what has built up these large organizations of car accountants.

When cars moved on mileage it was not essentially necessary to bother about whether they collect directly or whether they collected all of the mileage, and I imagine there was more or less fudging between the roads on mileage. Therefore, it did not require much of an organization as between railroads on mileage, but as per diem moved up the trunk line which was short of cars began to feel the pinch of an added or a high per diem rate. In other words it soon found it would be just as economical for it to buy and own its proportion of freight cars, and perhaps more economical, because it perhaps might make its operating statement look a little better, and it could get the money by issuing car certificates to bankers and paying 25 per cent for the first payment down. Whether it made any more money in his pocket or not is a question, because by the time he has paid for his cars and paid his interest on his cars and paid the added car accountants, he may perhaps come out with his cash in his pocket at about the same place, but his statement looked a good deal better.

There is not any doubt in my mind but that the increase in per diem has materially increased the number of cars in the country. I have a statement here which shows that in November, 1921, per diem went up to $1. It took the year 1921 for the carriers to find out what that was going to do to them, and it took them part of 1922 to finance new cars, but here we find in 1923 orders placed for over 100,000 freight cars. I have not all the figures as to what the traffic requirements were at that particular time, but my impression is that a large number of those freight cars were bought in order to even up per diem. So my impression is that a greater part of the trunk lines of the country have got their per diem accounts pretty well evened up. In some of the annual reports of the trunk line railroads it was distinctly stated that they were planning to buy cars to even up their per diem accounts.

I have no criticism whatever upon the purchase of additional cars up to the present time. I think we have reached the economic condition on the ownership of cars now, and there is another reason why I think that, which is that the latest reports that I have seen on the question of car repairs show that they are creeping up a little, they are not repairing cars quite as rapidly.

Cars were primarily in my early days of railroad service used for controlling and getting traffic. In fact we would furnish our own cars and anything we could do to get cars was purely for the purpose of controlling traffic, and as a matter of fact that is the real value of cars. There would not anybody now, I believe, buy one hundred thousands cars and lease them at $1 a day if he knew he could get $1 a day. In other words the traffic men want traffic. They want to get business on the rails and I do not think they would be as dogmatic

about the per diem rules as the per diem association is if they were handling the per diem rules.

The per diem is only one question. The owners' repairs on those cars is a very serious question. You pay that out of the money you get for your per diem. In other words a car owner starts a car along over the railroads. Then the Master Car Builders' Rules come in and there are a lot of things done to that car before it gets to the other end that are charged back to the owner of the car. I would not accuse, I would not even suggest that there was any dishonesty in that character of work, but there is no profit in per diem after those items are taken into account. You have not only got to pay for your car while you are wearing it out, but you have got to keep it in repair while it is traveling over the various railroads, and when you get through you go out into the junk heap and look at your capital and it is a lot of cars that are unfit for further use.

If a car owner is a car user, and in the use of that car he has been amply rewarded in the freight rate, then it presents a different question as to the use of the car when he turns it over to the little fellow. Let us take this illustration; here is a road five miles long that connects with a trunk line; they have joint rates, but the divisions are made up by an arbitrary beyond the junction point plus an arbitrary taken away from the trunk line. If you are going to arrange that division, then it is going to be necessary to do one of two things; take as much away from the trunk line's present earnings as the per diem costs the short line, which would be equal to giving the short line free time, or add to the junction point arbitrary a sufficient amount to pay for per diem.

Proposed Substitute Rule

I have a rule here. I will present that now as an exhibit in the form of a substitute for paragraph (b) of rule 6 (*Railway Age*, April 7, page 805).

Paragraph (b) of rule 6 is uneconomical. It is inconsistent. It comes very close to a violation of the law. It is against public interest and it is an attempt by rule of the association to direct the local affairs and conditions of even the trunk line carriers without knowing anything about those conditions, and it is my opinion that the chief executives of these trunk line railroads are in a good deal better position to deal with the economic local conditions than any association or organization, and they should be permitted to do so. That is complete discrimination between carriers. I am not a lawyer and cannot cite you to that. It is distinct discrimination, just as much discrimination as though you were to put in your passenger tariffs that a passenger six feet tall should ride for six cents a mile and one five feet tall shoull pay four cents a mile.

They are not treated all alike on the same basis, because they do not allow a switching reclaim. They make the qualification for that character of treatment, the associations to which they belong.

I think this rule is sufficiently elastic to permit the carriers to deal among them in their own way. I think it will permit the trunk lines to waive per diem in any territory for seasonal loading. It is unthinkable that there should be any rule or association that prohibits the storing of empty cars for seasonal loading. This rule permits that to be done.

This rule places a burden upon the short line who does not return the cars promptly. This rule pays just as much for private line cars as the commission has fixed they should be paid.

This rule pays just as much to trunk line railroads for freight car ownership as the commission has fixed for private car ownership and just as much as the trunk lines by strong-arm methods have fixed for the cars owned by non-members.

We are not asking any of our members to withdraw from the per diem agreement. Any arrangement that the subscriber lines make between themselves is entirely satisfactory with us, and this does not change it in any manner, but this does fix a rate that will preserve the little weak carriers. It does fix the rate that the trunk lines themselves have fixed for the use of the cars for the little carriers, and are doing it under strong-arm methods.

I have noticed all the way through the testimony here where some fellow has said, "Well, you want something for nothing." No, we do not, but we do not want the trunk lines to have something for nothing.

I think the Birmingham Southern case is a very proper case, and you will notice here that whenever a carrier holds a car 24 hours, received empty and returned empty, or 72 hours cars received loaded and returned empty, 72 hours received empty and returned loaded, and 144 hours on cars received loaded and returned loaded, if they do not get them back under that then they pay demurrage. In other words we do not believe that any character of a rule should be fixed that would allow short lines to take the trunk lines' cars out on their roads and keep them indefinitely. So this is a real rule to drive the cars back home or pay the demurrage.

I think that if this rule is promulgated by the Interstate Commerce Commission you will very quickly see the trunk lines and the short line fellows getting together and taking into consideration all the conditions surrounding their particular locality and arriving at some plan between them that will be satisfactory to them both, and then the strong arm will disappear.

Without this character of relief the commission is going to be absolutely flooded after this hearing is over, if the commission fails to give relief to this situation, they are going to be with individual cases, and many, many of the carriers in the country are going into the scrap heap before relief can be granted.

I do not think it makes any difference who owns the railroad, any more than it makes any difference who owns the cars. I do not think that a railroad owned by an industry has any different position than a railroad owned by Smith, Brown or Jones, except that a commercial railroad owned by an industry that handles principally the business of the industry is a godsend to its trunk line connections, and I should be greatly astonished if I could find a single case where the trunk line grants that carrier as much as it costs the trunk line to operate its own lateral branch lines.

Detrimental to Public Interest

I think that as Rule 6 now stands, with Paragraph B annexed, it is very detrimental to the public interest. I think that, unless relief is found in this case, or some case in the very near future, by the Interstate Commerce Commission, or some action taken by the per diem association themselves, to relieve the freight costs of car hire to many of these little railroads it is going to hark back into the public interest very materially. And, for that reason, it is going to destroy some of these properties. It is a matter of judicial knowledge that a great deal of mileage, in this country is in jeopardy, and when you consider that the per diem rate, since 1910, has advanced 500 per cent; in fact, it has gone from nothing to $1 a day for most of these little railroads, as high as 40 and 50 per cent of some of these roads' income is taken to pay car hire. I have recently come in contact with a railroad in Illinois that was saved by the public putting up $161,000 of their own money, and in the operation of

the road, the first year, they lost $115,000 of the $161,000, and of that $115,000, $49,000 was taken to pay car hire. The Chicago, Springfield & St. Louis, 78 miles long, running from Springfield, Illinois, to Alton. Now, that per diem represented 42 per cent of their loss. And, if that situation is permitted to continue, that road will have to stop within the next two or three years. And, if it does stop, the people will have lost not only their $161,000, which they put into the property to save it, to start it going again, but they will lose their investments in the towns.

Believes It Workable

I think that the rule that I have offered here in place of Paragraph (b) of Rule 6 is workable, and I think it is capable of giving material relief to the situation, without serious injury to the car owners, and I think relief must be found, or the transportation facilities amounting to a number of millions of dollars of people's investment in this country are going to be destroyed.

Suppose that the traffic associations were to make a rule which would provide that no rates should be paid at less than $1 per ton per mile. The rigidity of that situation would just upset the whole freight rate structure of the country. Now, the making of a rule that, regardless of what use is being made of the car, $1 a day shall be paid to the car owner by the line which holds or has the car in its possession, upsets the economic situation, just as much as if you made a rule of 1 cent per ton per mile on freight. In other words, there is a difference in character, there is a different thing; a terminal is a different situation; a short haul is a different situation. As I explained before, some railroads pay no per diem at all on certain movements of cars, but when you take every movement of car being a terminal movement—it does not make any difference where it comes from—and then you add $1 a day for terminal movement, and all that that carrier has is terminal movement, then you are assessing him an unfair proportion of the car hire.

Traffic Increase Estimated

WASHINGTON, D. C.

TRANSPORTATION requirements for the United States for 29 of the principal commodities in the second quarter this year (April, May and June) are estimated at approximately 9,035,963 cars, an increase of about 323,250 cars or 3.7 per cent as compared with the loading for the corresponding period in 1927, according to reports received by the Car Service Division of the American Railway Association from the thirteen Shippers' Regional Advisory Boards, which now cover the entire United States.

This estimate is based on the best information obtainable as to the outlook, so far as transportation requirements are concerned, by the various commodity committees of the thirteen separate boards.

Of the thirteen boards, nine estimated an increase for the second quarter of the year as compared with the same period last year, while the other four estimated a decrease. The ten boards estimating an increase were the Atlantic States, Allegheny, Great Lakes, Northwestern, Central Western, Southeastern, Southwestern, Middle Western and the Pacific Northwest boards. Those estimating a decrease were the Ohio Valley, Pacific Coast and the Trans-Missouri-Kansas boards as well as the New England board which estimated a very small reduction.

The estimates by the various boards as to freight loadings by cars anticipated for the 29 principal commodities in the second quarter this year compared with the corresponding period in 1927, and the percentage of increase or decrease, are as follows:

Board	1927	1928	Per cent of increase or decrease
New England	168,209	167,902	.2 decrease
Atlantic States	1,064,492	1,070,377	.6 increase
Ohio Valley	1,165,028	1,130,758	2.9 decrease
Northwestern	500,164	513,492	2.6 increase
Central-Western	236,841	253,050	6.8 increase
Pacific Coast	367,896	362,105	1.6 decrease
Pacific Northwest	295,038	308,225	4.5 increase
Allegheny	1,108,738	1,227,365	10.7 increase
Great Lakes	703,464	760,615	8.1 increase
Southeastern	1,154,123	1,163,519	.8 increase
Middle-Western	1,037,021	1,169,800	12.8 increase
Trans-Missouri-Kansas	397,493	389,123	2.1 decrease
Southwestern	514,202	519,632	1.1 increase

In submitting reports to the Car Service Division, each board estimated the freight car requirements for the principal industries found in the territory covered by that board. On the basis of this information, the Car Service Division estimates that of the 29 commodities, increases in transportation requirements will be required for 24 as follows: All grain, flour, meal and other mill products; other fresh fruits; potatoes; other fresh vegetables; livestock; poultry and dairy products; coal and coke; ore and concentrates; clay, gravel, sand and stone (including gypsum, crude and powdered); salt; lumber and forest products; petroleum and petroleum products; sugar, syrup, glucose and molasses; iron and steel; cement; brick and clay products; lime and plaster; agricultural implements and vehicles, other than automobiles; automobiles, trucks and parts; fertilizers, all kinds; paper printed matter and books; chemicals and explosives, and canned goods—all canned food products, (includes catsup, jams, jellies, olives, pickles, preserves, etc.)

Commodities for which a decrease is estimated were hay, straw and alfalfa; cotton, cotton seed and products; citrus fruits, and castings, machinery and boilers.

The estimate by commodities for the second quarter compared with the same period last year follows:

Commodity	Car loadings		Estimated Per Cent	
	Actual	Estimated	Inc.	Dec.
Grain, All	294,683	310,875	5.5	...
Flour, Meal & Other Mill Products	224,620	232,860	3.7	...
Hay, Straw and Alfalfa	72,608	68,172	...	6.1
Cotton	47,341	37,283	...	21.3
Cotton Seed and Products	25,742	15,708	...	39.0
Citrus Fruits	34,356	27,137	...	21.0
Other fresh fruits	82,970	84,098	1.4	...
Potatoes	59,013	62,042	5.1	...
Other fresh vegetables	82,272	84,992	3.3	...
Live Stock	359,385	368,653	2.6	...
Poultry and Dairy Products	37,189	38,745	4.2	...
Coal and Coke	2,481,687	2,545,375	2.6	...
Ore and Concentrates	675,190	677,429	.3	...
Clay, Gravel, Sand & Stone (incl. Gypsum, Crude & Powdered)	1,021,798	1,104,169	8.1	...
Salt	10,981	11,002	.2	...
Lumber & Forest Products	1,008,929	1,028,487	1.9	...
Petroleum & Petroleum Products	513,293	538,675	4.9	...
Sugar, Syrup, Glucose & Molasses	50,917	51,926	2.0	...
Iron and Steel	467,359	479,533	2.6	...
Castings, Machinery and Boilers	61,102	59,977	...	1.8
Cement	249,073	263,931	6.0	...
Brick and Clay Products	204,106	209,506	2.6	...
Lime and Plaster	66,051	68,154	3.2	...
Agricultural Implements & Vehicles Other than Automobiles	38,530	42,458	10.2	...
Automobiles, Trucks and Parts	242,566	312,777	28.9	...
Fertilizers, All Kinds	135,854	137,329	1.1	...
Paper, Printed Matter & Books	71,650	78,672	9.8	...
Chemicals and Explosives	61,431	63,211	2.9	...
Canned Goods—All Canned Food Products (includes Catsup, Jams, Jellies, Olives, Pickles, Preserves, etc.)	32,013	32,787	2.4	...
Total All Commodities Listed	8,712,709	9,035,963	3.7	...

THE CITY OF BIRMINGHAM, ALA., has adopted an ordinance under which $4,000,000 will be expended for the elimination of railroad grade crossings within the business district.

Train-Hour Saving Cuts Overtime

Complete totals for 1927 show traffic handled with 37½ per cent less crew overtime than in 1923

ALTHOUGH the net ton-miles handled by the railroads in 1927 were approximately 4 per cent greater than in the busy year of 1923, the amount of freight-train crew and engine crew overtime was about 37½ per cent less than was required for the 1923 performance. If the overtime is related to a ton-mile basis, it appears that the amount of crew overtime per 100,000 gross ton-miles in 1927 showed a reduction from 1923 of no less than 43 per cent. This is one of the most important and most interesting details that appears in the 1927 statistical record.

A great deal has been said regarding the remarkable improvement in the economy of railway operation that has taken place in recent few years. This rather phenomenal saving in freight crew overtime seems, however, to be a particularly interesting and important phase of the results of the carriers' economy program that thus far does not seem to have received the attention that it properly merits.

In an article in the *Railway Age* of February 25 entitled "Train-Miles and Train-Hours Decrease," the

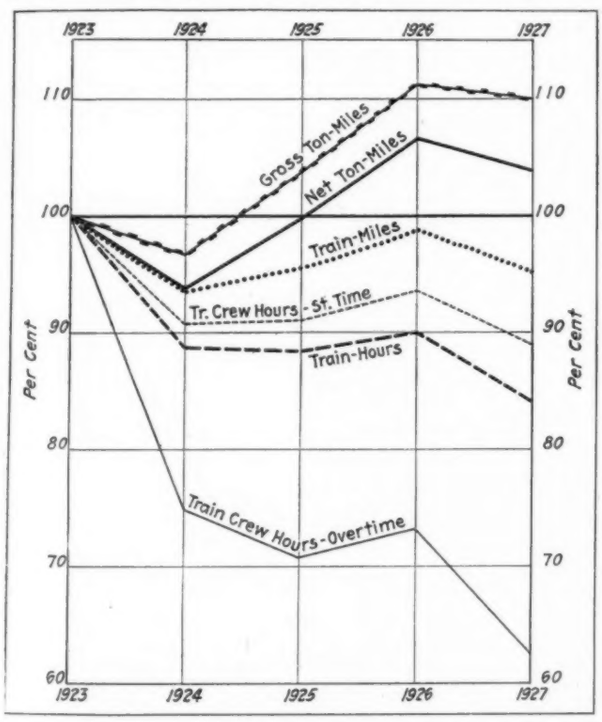


Chart 1—Comparison of Trend of Ton-Miles, Train-Miles, Train-Hours and Train Crew-Hours, Class I Railroads, 1923 to 1927, Presented in Percentages of 1923 Figures

point was made that in the years from 1920 to 1926 the railroads so improved their operation that they have been able to move a substantially larger traffic without any increase in their freight train-miles. This result was shown to have been made possible because the increase in the gross and net train load was just sufficient to absorb the increase in the gross or net ton-miles, respectively, and thereby avoid the necessary of running additional train-miles.

In addition, it was shown that there had been a substantial increase in the average speed of freight trains. This speeding up was attributed to better motive-power and to the elimination of delays on the road, such reduction in delays having been made possible by an increased mileage of automatic signals, by improved dis-

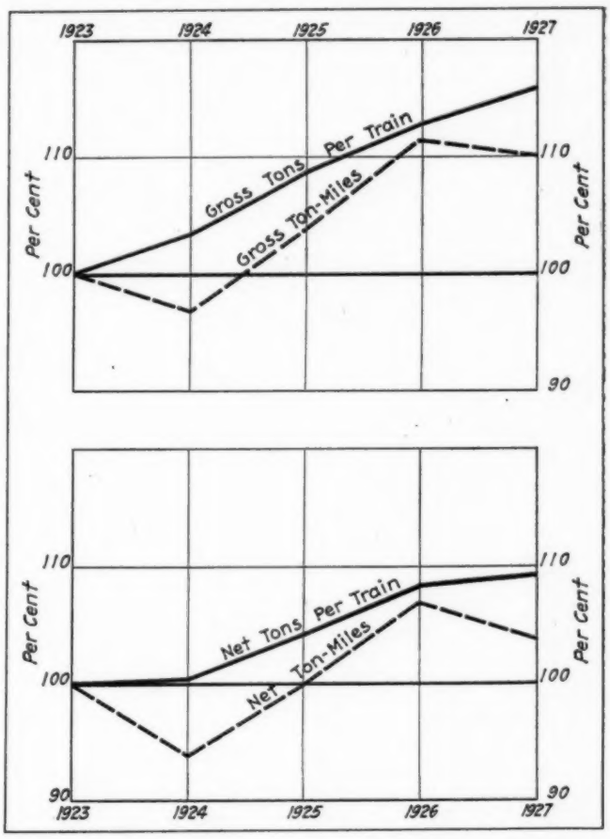


Chart 2—Showing How Increase in Train Load Has Exceeded Percentage Increase of Ton-Miles

patching or by other factors. It was indicated that in 1926, as compared with 1920, although the net ton-miles increased about 9 per cent, the train-miles remained the same, while the freight train-hours showed a decrease of about 14 per cent. Particular emphasis was placed on the fact that the increased train-speed had taken place without loss of train-load; as a matter of fact, it was shown that the average train-load had substantially increased.

In the previous article comparisons were included covering the first ten months of 1927, the figures for which were at that time the latest available. The purpose of the present article is to bring the previous study down to date by the inclusion of the figures for the full year 1927. The attempt will also be made to analyze somewhat more adequately the savings that may have resulted from the speeding up of freight train service or from the saving in freight train-hours. In this instance, the comparisons will be made for the years 1923 to 1927. The results will be presented in ratios of the figures for 1923 taken as 100. The reason for using 1923 as the base instead of 1920, as in the earlier article, is the inclusion of the train-crew and

engine-crew hour statistics. These date back in their present form to the middle of 1921 only. The year 1923 forms a suitable base because it was an extremely busy one and the first year after federal control in which railway operations could be said to have approached normalcy.

The presentation is chiefly in the form of charts. These are five in number. In Chart 1, there are plotted for the years 1923 to 1927, with 1923 as a base of 100, the curves of ton-miles, train-miles, train-hours and

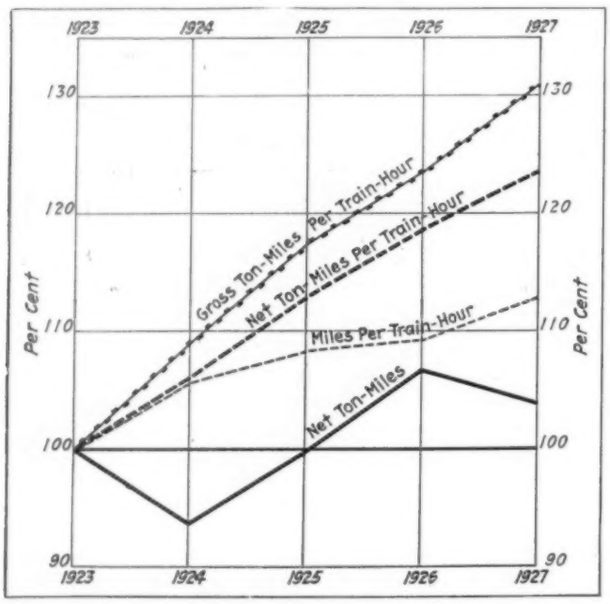


Chart 3—Increase in Train Speed Combined with Increase in Train Load Has Effected Marked Increase in Ton Miles per Train Hour. Period 1923 to 1927. Presented in Percentage of 1923 as Base

train-crew hours. It appears that the gross and net ton-miles, while slightly below the record-breaking levels of 1926 were substantially in excess of those of the other years of the period under consideration. Due to the increase in the train-load—as further evidenced in Chart 2—the train-miles of each of the years following 1923 were less than in the base year of the period. As a result of the reduction of the number of train-miles, combined with the increased average freight train speed, the train-hours show an even greater decrease; the drop in the curve of freight train-hours in 1927 was particularly noticable.

There are also shown on Chart 1 two curves of train-crew hours. One is for straight time and the other for overtime. The saving in freight train-miles or of freight train-hours has resulted in no inconsiderable reduction in freight train-crew straight time hours. There is a fair question as to the value of saved hours of straight time beyond those made possible by reduction of train-miles. This follows because train-crew compensation is on the basis of 12½ miles per hour and because the wages are based on the miles or hours, whichever is greater. In other words, there is no economy from the standpoint of train-crew wages if a freight train run which previously required eight hours of crew time, including terminal allowances, for a distance of 100 miles were so speeded up as to require but seven hours. The compensation would be the same in either case.

It is only when overtime is involved that a saving is made, as if, for instance, in the case mentioned, there had been a reduction in crew hours from 10 to 8. Apparently there has been a rather remarkable improvement with respect to the overtime hours during the past four years because the lower curve on Chart 1 shows that in 1927 as compared with 1923 there was a reduction of train-crew overtime of 37½ per cent.

While the man-hour curves on Chart 1 deal with the train crew, it should be understood that precisely the same result would appear if, instead, the curves were given for the engine crew. Such curves are given in another chart and are referred to in some detail below.

Chart 2 has already been mentioned. It is included to emphasize that the speeding up of freight train operation has taken place without loss of the economies that accompany increased train-load. The chart shows that the increase in the gross tons per train and in net tons per train since 1923 has been in larger percentage than the increase in gross and net tons moved. This will explain more fully the reason for the decrease that has taken place in the train-miles, even with the increased traffic. In Chart 3, the other side of the picture is presented; namely, the increase in train speed. The chart shows that in each of the years since 1923 there has been an increase in the average miles per train-hour. The figure for 1927 shows an increase over 1923 of 13 per cent. Shown also on this chart are the curves of gross ton-miles per train hour and of net ton-miles per train-hour. Increase in these units has resulted from the combination of increased train-load and train-speed. The gross ton-miles per train-hour in 1927 show an increase over 1923 of 31 per cent, which should be accepted as a fairly satisfactory improvement for a mere four-year period.

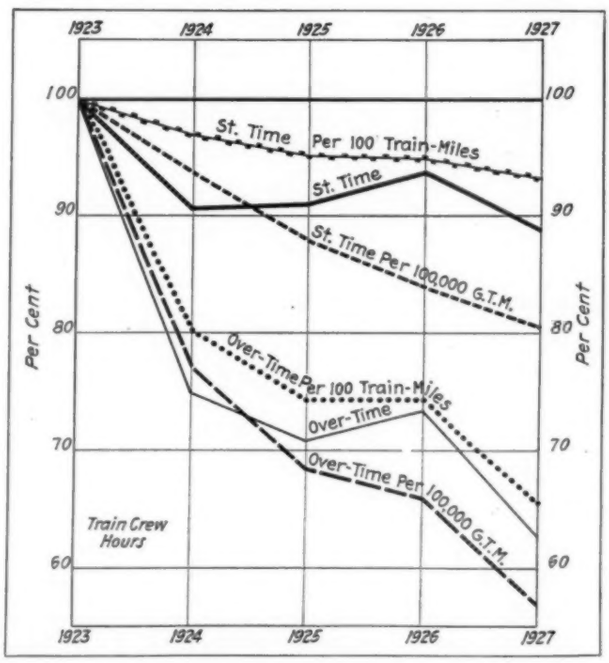


Chart 4—Increased Train Load with Increased Train Speed Has Resulted in Marked Decrease in Train Crew Overtime Hours

Chart 4 is intended to supplement Chart 1. It is a comparison of the train-crew hours related to train-miles and to the volume of gross ton-miles. The chart shows that there has been, since 1923, a noticeable reduction in the train-crew straight time hours. The straight-time hours per 100 train-miles, naturally enough, have shown only a slight change. Because of the increase in the train-load, there has been a much greater decrease in the train-crew hours per 100,000 gross ton-miles. Chart 5 shows the same data for engine crew-hours.

The important phase, however, in either Chart 4 or 5 is the overtime. It will be observed that the engine-crew overtime in 1927 amounted to 37½ per cent less than in 1923, showing the same reduction as the re-

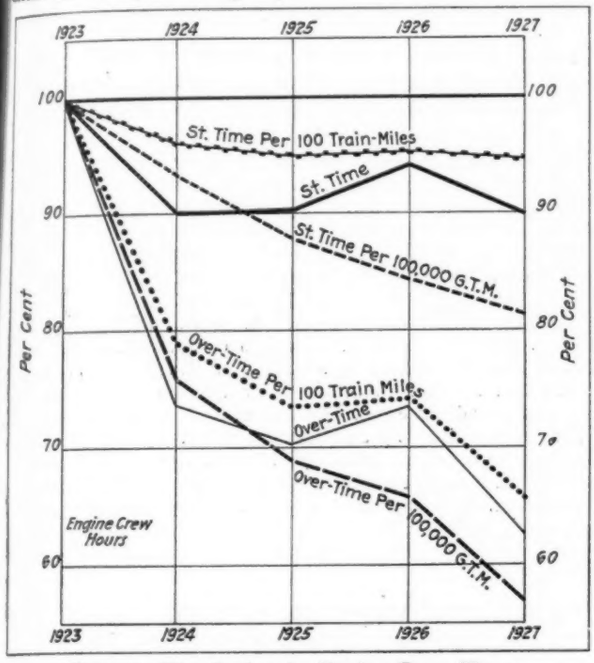


Chart 5—The Saving in Engine-Crew Hours

duction in train-crew overtime shown in Chart 1 or 4. Of greater interest possibly is the reduction in the crew overtime when related to the traffic. The curves of engine and train-crew overtime per 100,000 gross ton-miles show a reduction in 1927 as compared with 1923 of 43 per cent.

Urge Motor Coach Regulation

WASHINGTON, D. C.

HEARINGS on the latest Parker bill, H.R.12,380, to provide for a plan of regulation of common carrier interstate motor coach operations, were begun before the House committee on interstate and foreign commerce on April 10 and passage of the bill was urged by representatives of the railways, motor coach operators and state commissions, although each of these interests proposed some amendments to the bill in its present form.

R. N. Van Doren, vice-president and general counsel of the Chicago & Northwestern, and chairman of the law committee of the Association of Railway Executives, testified on April 11 in support of the bill but he urged an amendment relieving operators of motor vehicles that have obtained certificates of convenience and necessity from the operation of the anti-trust laws so as to enable railways to buy out competing coach lines and substitute motor vehicle service of their own if necessary to insure adequate service in order to reduce train service. The railroads claim no vested interest in transportation and no prior right to the highways, he said, but some of them may be required in self-defense to go into the motor coach business or even the truck business and do not believe there should be any provision of law to prevent them. He pointed out also that the proposed amendment would make it possible for motor vehicle operators to combine into stronger units. The text of his proposed amendment follows:

Any common carrier which shall engage in the transportation of passengers by motor vehicle upon the public highways, or which shall own and control a motor carrier which operates such motor vehicles, or which shall purchase and own the whole or part of the capital stock of a corporation organized or engaged as a motor carrier in the transportation of passengers by motor vehicle upon the public highways in interstate commerce, and for the operation of which motor vehicles a certificate of convenience and necessity has been obtained as in this Act provided, shall be, and it is hereby, relieved from the operation of the "anti-trust laws", as designated in Section 1 of the Act entitled "An Act to supplement existing laws against unlawful restraints and monopolies, and for other purposes," approved October 15, 1914, and of all other restraints or prohibitions by any law of the United States, in so far as may be necessary to enable it to own, control and operate, either directly or through a subsidiary corporation, such motor vehicles upon the public highways for the transportation of persons in interstate commerce.

Mr. Van Doren said he had participated in the conferences with representatives of other organizations that led to the drafting of the new Parker bill and that the others had agreed to the amendment. Regarding the attitude of the railways toward the bill he said they are not selfish and don't want all the regulation but they are not vindictive enough to wish for the motor coach industry the most rigid form of regulation, and hope it will be able to develop in a healthy way.

Explaining the bill he said that it proposes to regulate motor coach service only at the start and does not contemplate the regulation of trucks or of contract carriers because that business is comparatively undeveloped at this time. Moreover, it does not purport to authorize a commission to prescribe minimum rates but merely provides that rates shall be just and reasonable. "After forty years of railroad regulation we do not know just what 'just and reasonable' means," he said, but we do know that it means that rates must be reasonable to the public. We are not going to ask you to protect us against competition.

"We have a large investment to protect and we want to cut down our losses in passenger business. Most of the competition is from the private automobile but to a growing extent the public is taking to the motor coach and we cannot correspondingly reduce our expenses by cutting down our passenger service, particularly on branch lines. We are still a convenience and we have to operate trains in the winter when expenses are high although we may take some off in the summer. We don't believe in driving the little fellow out of business if he will maintain a satisfactory service 24 hours a day and 12 months in the year so we may take off our trains and reduce expense but often that does not work out and if he cannot we ought to be able to buy him out and furnish service ourselves."

S. A. Markel, chairman of the legislative committee of the Bus Division of the American Automobile Chamber of Commerce, was the first witness and explained the provisions and purpose of the bill, saying it had been agreed upon as providing for a simple plan of regulation that might be adopted at this session of Congress, applying only to common-carrier bus operations. He said that at conferences with representatives of the railways and state commissioners it had been agreed that the bill is in the public interest, although the motor coach operators are not unanimous as to all its provisions, and he submitted a list of ten amendments which he said were minor in character.

J. E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, attributed the origin of the new bill largely to Mr. Markel, saying he had recently been active in seeking to bring about consideration of a simpler bill than the first Parker bill, on which his association and other organizations had collaborated, but that officers and committee members had approved the new bill as far as it goes without in any way indicating a change of attitude toward the first bill, which included provision for regulation of motor trucks.

A similar bill has been introduced in the Senate as S3992 by Chairman Watson of the Committee on Interstate Commerce.

Looking Backward

Fifty Years Ago

Asa Packer, president of the Lehigh Valley, in his annual report for 1877, states that the steel rails at Packerton scales have now carried a gross tonnage of 35,264,464 tons and appear to be good for 10,000,000 tons more; two sets of iron rails at this point were worn out by the passage of 3,788,545 tons. Mr. Packer recommends the complete substitution of steel for iron rails.—*Railroad Gazette,* April 12, 1878.

On April 9 the United States senate, by a vote of 40 to 19, passed the Pacific railroad bill. The bill provides that a sinking fund shall be established by the Central and Union Pacific companies for the liquidation of their debt to the government. The Central Pacific [now part of the Southern Pacific] is to pay into the treasury, to be invested in United States bonds, $1,200,000 and the Union Pacific, $850,000 yearly. The declaration of dividends on the stock of the railroads is to be considered illegal so long as these sinking funds are not paid up.—*Railway Age,* April 11, 1878.

Twenty-Five Years Ago

The Federal court at Cincinnati, Ohio, has handed down a decision refusing to grant an application for an injunction restraining the Union Pacific from voting 900,000 shares of stock of the Southern Pacific at the annual meeting of the latter on April 8. Upon appeal by the plaintiffs the Union Pacific agreed to a postponement of the meeting.—*Railway and Engineering Review,* April 11, 1903.

A formal petition has been presented to the House of Commons of Canada for the incorporation of the Grand Trunk Pacific. The route outlined is from Quebec, Que., to Gravenhurst, Ont., or North Bay, thence in a westerly direction passing through Battleford, Sask., Edmonton, Alta., and Dunvegan, B. C., and thereafter by way of either the Peace River pass or the Pine River pass to Port Simpson, B. C., or Butte Inlet. Branch lines will be constructed to Port Arthur, Ont., Brandon, Man., Regina, Sask., and Calgary, Alta. The total mileage will be over 3,000.—*Railway and Engineering Review,* April 11, 1903.

Ten Years Ago

In recognition of the excellent showing made by American railroad engineer troops in the battle of Cambrai and in recent engagements in Picardy, the War department has announced that special and auxiliary units of the army, including the railroad engineers, are to be armed. The railroad engineer units will be supplied with rifles on the basis of 20 per cent of their enlisted personnel.—*Railway Age,* April 12, 1918.

"Instead of simplifying the problem of locomotive maintenance, the introduction of government standards would complicate it," Alba B. Johnson, president of the Baldwin Locomotive Works, stated on April 9, before a meeting of the United States Chamber of Commerce at Chicago. "These complications would outlast the period of government control and would continue as long as the railroad standard and the government standard locomotives operated side by side upon the same lines. The railroad manager who is responsible for his record of efficiency and economy should be permitted the widest discretion in selecting locomotives which he regards as best fitted for the conditions of service upon his line. Especially should this be considered most carefully when the world-wide danger of this war is upon us."—*Railway Age,* April 12, 1918.

TRAFFIC NOTE.—Live muskrats are a feature of traffic. forty of these animals were recently carried by the Canadian Pacific Express Company from Canada to Belgium, where is to be established the nucleus of a fur industry.

New Books

Floodtide of 1927. Compiled by Luther B. Johnson. 181 pages. 5½ in. by 8½ in. Bound in paper. Illustrated. Published by the Roy L. Johnson Company, Randolph, Vermont.

This is a simply written, interesting account of the disastrous floods of November 3, 1927, in Vermont. While it makes no claim to exhaust the subject, it is nevertheless quite thorough and will survive, we believe, as a valuable historical document regarding one of the country's major natural disasters. The valleys bore the brunt of the Vermont inundation. Most of the railroads follow the valleys. Hence they suffered as much as—perhaps more than—any of the works of man in the stricken territory. This little book does not neglect the railroads. Indeed it would be strange if it did; since Vermont, having had its railroad service interrupted so long, probably now has as adequate an appreciation of what the railroad means to it as has any other section of the Union. At times the little book, which is always clear, touches real literature in its style. Altogether it is an extremely human document, and one which can be read with interest by anyone—particularly by a railroad man who may be curious to know how completely vicious a flood can be.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Enlargement of the Capitol Grounds. "Report of the legislation providing for the purchase of the property between the Capitol and the Union Station and the steps taken to acquire such property. ...." 70th Cong., 1st sess. House Doc. No. 125. 285 p. Pub, by U. S. Govt. Print. Off., Washington, D. C. 35 cents.

First, Second and Third Special Japanese Railway Issues, Modern Transport, March 17, 24, 31, 1928. History and present operation of the Japanese Government Railways showing organization of various departments, and describing construction, equipment, and all types of facilities. Illustrated. Pub. by Modern Transport, London, Eng. three pence each.

The Missouri Pacific—an Outline History, by John Leeds Kerr. Brief, but informative, this handsome book traces the development of the Missouri Pacific from 1850 to the present. Illustrated. 50 p. Pub. by Railway Research Society, New York City. $2.50.

Report on the Railways of Iraq, by Brig.-Gen. F. D. Hammond. Whether one is interested in railways generally or Mesopotamia in particular, this report will be interesting, particularly against a background of the campaigns in Arabia and Gertrude Bell's "Letters." 129 p. charts. One edition has map. Pub. by the Crown Agents for the Colonies, London, Eng., 5 shillings.

Periodical Articles

The Mechanical Engineer in Industry, by Marion B. Richardson. Some of the things discovered in a study of opportunities afforded the mechanical engineer in the railway and railway supply industry. Mechanical Engineering, April 1928, p. 332-333.

The O'Fallon Railway Recapture Case, by Harold Evans. A review, with comment. American Federationist, April 1928, p. 410-417.

Railroads in Cuba During 1927, by Wm. B. Murray. Includes list of railways and length of each in kilometers. Commerce Reports, March 26, 1928, p. 835-836.

Odds and Ends of Railroading

For the most peculiar name in railway service, this department lends its support to History Harrison, colored porter at the Louisville & Nashville station at Pensacola, Fla.

The transcontinental foot race from Los Angeles to New York, was not without its railway entry. J. A. Pollard, machinist at Sparks, Nev., on the Southern Pacific, is among the prominent contenders.

Henry Noble, foreman painter on the Chicago Terminal division of the Chicago, Rock Island & Pacific, is not only adept with the brush and can, but also with the brush, palette and easel. His landscapes have been in many exhibitions and have met with much praise at the hands of competent American and foreign critics. Mr. Noble is carrying on the traditions of Rembrandt and Hals, since he, too, is a Hollander by birth.

In line with our facility in digging up interesting, if unimportant, facts for this department, we submit the following. Did you know that Jack Kearns, then manager for Jack Dempsey, left the scene of the Dempsey-Gibbons fight at Shelby, Mont., in the cab of a locomotive, which he rented at a reported rate of $500? The reason for the special service is found in the fact that Kearns, at the time, was carrying on his person some $90,000, the proceeds of the fight.

Bill Shatoff was once a trucker in a freight station in this country. The same Bill is now manager-in-chief of the new Siberian-Turkestan railway being built by the Russian Soviet government. It is reported that the project will cost $100,000,000 and Bill is the boss of construction. This may seem strange to American engineers, when the fact is known that this is Bill's first railway experience since he was a trucker in the old days, but stranger things than that have happened in Russia.

Horace F. Smith, lately elected senior vice-president of the Nashville, Chattanooga & St. Louis, comes of a family of railroad men. His brother, Milton H. Smith, who died in 1921, was president of the Louisville & Nashville for 30 years and a son, Addison R. Smith, is vice-president in charge of traffic of the L. & N. Incidentally Mr. Smith received his latest promotion on March 1 about 10 years past the time of life when most men plan to get out of the railroad business. On April 30 he will celebrate his 81st birthday.

An Echo from the Past

"What has become of the locomotive and train of cars I gave you for Christmas?" asked father.

"All smashed up," replied the boy. "We have been playing government ownership."

Another Railroad Kipling Fan

F. S. Henderson of the Canadian National at Halifax, N. S., having read this department's paragraph on the two Soo Line stations named "Rudyard" and "Kipling" writes to ask whether our readers know of any other stations or bridges or other railroad property named from Kipling or his characters.

To Make It a Real Russian Story the Owl Really Ought to be Executed

Strange tales come out of Russia. For instance, report has it that every engineman involved in a wreck is executed. It is to be wondered what punishment Engineman Vladimir Vlasko drew for being involved in the following case. It appears that Vladimir, at the throttle of the Vologda-Leningrad express, was buzzing along at some 50 miles an hour, when the train came to a most abrupt stop, piling them up in the front end. Vladimir climbed out into the snowdrifts to investigate. He found that an owl had perched on the locomotive and had clutched the cock of the airbrake valve, letting out the air and stopping the train. The owl was captured alive and the train proceeded. It may be that "owl stories" are the Russian counterpart of American "fish stories."

These Plagued New-Fangled Contraptions

The railways, when first promoted, had to meet great opposition from many sources. In a speech before the House of Commons of Great Britain, in opposition to the granting of a charter to the Liverpool & Manchester Railway, Admiral Sir Isaac Coffin said in part:

"I would not consent to see the widow's premises and strawberry bed invaded. Railroad trains would take many hours to perform the journey between Liverpool and Manchester and in the event of the scheme succeeding, what, I would like to ask, will be done for all those who had advanced money in making and repairing turnpike roads? What with those who still wished to travel in their own or hired carriages, after the fashion of their forefathers? What was to become of the coachmakers, harnessmakers, coachmasters and coachmen; innkeepers, horse breeders and horse dealers? Was the House aware of the smoke and the noise, the hiss and whirl which locomotive engines, passing at the rate of ten or twelve miles an hour, would occasion? Neither the cattle plowing in the fields, nor grazing in the meadows, would view them without dismay. Iron would be raised in price 100 per cent or more probably exhausted altogether. It would be the greatest nuisance, the most complete disturber of quiet and comfort in all parts of the kingdom the ingenuity of man could invent."

Truth in Railway Maps

The movement of non-distorted and non-pictorial maps in railway time tables seems to be a time-honored cause. At the annual meeting of the General Passenger and Ticket Agents' Association at Jacksonville, Fla., in March, 1878, George H. Heafford, general passenger agent of the Missouri Pacific, made a plea for truth in railway maps. He said:

"If this world could be made over according to some of our ideas, I have not the faintest doubt but that the railroads we represent would all be the straightest and shortest lines between every prominent city in the country, in which case all through rates could be made up on the sum of the locals, scalpers would find their business gone, justice would triumph and virtue reign supreme.

"As an instance of the good which results from the truthfulness depicted in the ordinary railroad map which we frequently find posted on the out-houses, dead-walls and fences of our large cities, may I be permitted to relate the following: When the Erie & Chicago line was first started, it ran from Chicago via Cleveland and Salamanca to New York, and its enterprising managers got out large posters depicting the route of the line in the broadest band of the blackest ink, and placing the names of a few of the largest cities in large letters about six inches apart and upon nearly the same parallel of latitude. One day four gentlemen of the Celtic persuasion, attracted by the appearance of the map stretched outside of the Chicago office, called upon the gentlemanly agent and desired to know the price of second-class tickets to New York, and were informed that the fare was about $20, which seemed to stagger them somewhat, and after some little consultation they went outside and recommended the study of that wonderful map.

"By means of a foot measure and the use of their knowledge of that mathematical term known as the 'unknown quantity,' they discovered that Chicago and Cleveland were only about four miles apart, and that the other stations named were about similarly placed as to distance. The final conclusion of the party was summed up by the leader thereof with the brief and decisive remark: 'Be jabbers, it's not far, let's walk!' and they may be walking yet for all I know."

NEWS *of the* WEEK

On the New York Central at West Pulaski

THE ASSOCIATION OF RAILWAY CLAIM AGENTS will hold its annual meeting on June 20 to 22 at Omaha, Neb.

AN AIR MAIL LINE between New York and New Orleans through Atlanta, is announced by the Post Office Department, service to be begun on May 1. The schedule proposed is: leaving New York 9.40 p. m., arrive Atlanta 6:17 a.m.; New Orleans, 11 a.m.

THE SOUTHERN PINE ASSOCIATION, at its annual meeting in New Orleans, La., on March 28, elected as president F. W. Reimers, Hammond, La. and vice-president, M. L. Fleishel, Jacksonville, Fla; and reelected O. O. Axley, vice president; H. C. Berckes, secretary-manager and H. M. Young, treasurer.

THE ATCHISON, TOPEKA & SANTA FE has issued a 232-page book containing reprints of all issues of the "Santa Fe System Lines Bulletin" which it has published monthly since November 1, 1923. The reprints have been made in this form in response to the public interest manifested in the various subjects discussed.

THE RAILWAY CLUB OF PITTSBURGH will hold its next meeting on April 26, at the Fort Pitt Hotel, Pittsburgh, Pa., when a paper will be read on "Effects of Copper Bearing Steel in Freight Cars" by Dr. J. S. Unger, manager, Central Research Bureau, Carnegie Steel Company, Pittsburgh.

THE WESTERN RAILWAY CLUB will hold its next regular monthly meeting at 8:15 on Monday evening, April 16, at the Hotel Sherman, Chicago, the subject being "Modern Yard and Terminal Facilities." Two speakers have been secured, R. H. Ford, assistant chief engineer of the Chicago, Rock Island & Pacific, and J. S. Morris, engineer of shops and machinery of the Nickel Plate.

THE CHICAGO & NORTH WESTERN is to change the color of the cars in its through passenger trains from yellow to the standard Pullman green and thereby abandon a practice which has been in use since the first North Western line was built. Two reasons are given for the change. One is that trains carrying both green and yellow cars are objectionable to the eye, and it is more difficult to keep the yellow cars clean. The yellow color will be retained in suburban service.

Senator Dill, of Washington, has introduced in the Senate a bill, S. 3980, providing that railroad employees shall not be required to work more than six days per week consecutively except when the division superintendent or some higher official shall declare that an emergency exists, and that in no case shall an employee be compelled to work more than thirteen days consecutively. The bill also provides that every employee shall be permitted at least four days of rest out of each calendar month and that the monthly rate of pay shall not be decreased because of its provisions.

New York Railroad Club Meeting

The April 20 meeting of the New York Railroad Club to be held at the United Engineering Societies Building will be a "Baldwin Locomotive Works Night." The subject will be "The Missionary of Civilization," a motion picture, which will be introduced by W. A. Austin of the Baldwin Locomotive Works.

Pennsylvania Employees in College

Twelve employees of the Pennsylvania at Columbus, Ohio, are attending Ohio State University; and, according to the Pennsylvania News, they are doing full-time class work in school while at the same time filling, acceptably, positions in the yard. Including these students and others of recent years, the yard service has had representatives in every department of the University. The present list includes six brakemen, four callers, one switch tender and one targetman. Three brakemen and a caller are in the Medical College.

A Thousand Dollars a Word

"Certified by Centuries of Service" is the winning slogan submitted in the contest for a lumber slogan recently conducted by the National Lumber Manufacturers' Association. It was contributed by James E. Noble, Jr., an engineer with the Southern Bell Telephone & Telegraph Company, Sanatorium, Miss. The prize was $5,000. A second prize of $2,000 was awarded to Mrs. Dora D. Farrington, professor of journalism at Hunter College, New York, for the slogan, "Wood, use it—Nature renews it," while Mrs. Maud Burt, Marshalltown, Ia., won the third prize of $1,000 for the slogan "Use it—Nature Renews it." A total of 370,000 slogans were entered in the contest.

Tie Producers' Program

The National Association of Railroad Tie Producers will hold its Tenth Annual Convention at the Arlington Hotel, Hot Springs, Ark., on April 24-26. The convention will be called to order at two p. m. on Tuesday, April 24, by A. R. Fathman, president. At the opening session, following the transaction of routine business, a paper will be presented on "Gum Ties" by W. J. Smith, tie and timber agent, Missouri-Kansas-Texas Railroad, Denison, Tex., followed by the reports of the committees on Statistical Information and on Specifications for Industrial Track Ties. Among the papers to be presented on Wednesday morning are one on the "Future of the Cross Tie Demand" by Earl Stimson, chief engineer of maintenance, Baltimore & Ohio and another on "Failures of Substitute Cross Ties" by Nelson Courtland Brown, professor of forest utilization, New York State College of Forestry, Syracuse, N. Y. Conditions in the tie industry will be reported by the district officers of the Association at the session on Thursday morning. The annual dinner of the Association will be held on Wednesday evening with addresses by J. M. Kurn, president, St. Louis-San Francisco and H. Brough, former governor of Arkansas.

New York State Laws

Governor Smith, of New York, has signed the bill (now Chapter 823) amending the law concerning the purposes for which a railroad corporation may be formed. Section 5 is amplified to authorize the acquisition of a railroad (owned by a New York corporation) which is not operated under the railroad law, provided the Public Service Commission consents.

The governor has signed Chapter 806, an amendment to the Buffalo grade crossing act and Chapter 825, amending the Syracuse grade crossing act; also Chapter 808 amending the Rapid Transit act in relation to payment of awards in condemnation proceedings.

The bill authorizing the Port of New York Authority to study the suburban passenger problem is vetoed; the governor says that the Port Authority has a sufficiently large task in dealing with the New York City freight problem.

The proposed law to charge to the state a portion of the cost of installing automatic signals at highway crossings is also vetoed, because it is not workable; no appropriation was made and therefore the state funds would not be available.

B. & M. Employees' Fund

The Boston & Maine Railroad Employees' Fund has been incorporated, with a board of five trustees, to receive and administer the fund of $100,000 given by the directors of the road for the benefit of employees on the advice of Homer Loring, recent chairman of the Board of Directors, when he declined that sum for his recent special services.

The trustees are: Mr. Loring, President George Hannauer, W. Rodman Peabody, member of the board of directors; Cameron MacKay a passenger conductor on the Portland division, and Joseph M. Sullivan passenger trainmaster, Terminal division. Mr. Loring was chosen chairman, and Arthur B. Nichols (Boston) treasurer and clerk.

The purposes of the corporation under which the fund is to be received and administered in trust, are stated as follows: "To advance the general welfare of the employees, in whatever capacity of service, of the Boston & Maine Railroad and of its subsidiaries, by disbursing the funds of this corporation to the benefit of such employees and their dependents for such educational, charitable, literary or scientific purposes, as authorized by section 2, of chapter 180, of the general laws of Massachusetts."

Mr. Loring, who insisted that this money, which was voted him for his work in rehabilitating the Boston & Maine should be given by the railroad corporation instead to such a fund, consented to serve as a trustee only on a temporary basis. The specific application of the fund will be determined later.

Wage Increases Granted to Milwaukee and Great Northern Clerks and Warehouse Men

Two western railroads, the Chicago, Milwaukee, St. Paul & Pacific and the Great Northern, have granted wage increases to more than 11,500 employees who come under the classification of clerks and warehouse men. The increase on the Milwaukee, which affects a total of 7,851 employees, provides for an addition of 3 cents an hour for clerks and 2 cents an hour for warehouse men. The advances were agreed upon in a conference between representatives of the men and officers of the railroad at Chicago on April 9.

The Great Northern increase came in the form of an award by an arbitration board which was filed in the United States District Court at St. Paul, Minn., on April 6. Under the terms of the award about 3,600 clerks, truckers, callers, stevedores and certain laborers, about one-fourth of whom are members of the Brotherhood of Railway Clerks, have been granted an increase of 4 cents an hour which is retroactive to August 1, 1927. An arbitration board was formed early in 1928 to consider the original demand of these employees, which was for an increase of 10 cents an hour and hearings were begun on January 23, with Judge F. D. Meighen of Albert Lea, Minn., J. A. Cochrane, assistant to the vice-president of the Great Northern, and J. H. Sylvester, grand vice-president of the Brotherhood of Railway Clerks, as members.

Conductor Acts for Foreign Road While on Its Track

A freight conductor running over the rails of a foreign road is subject to the operating rules of the foreign road. This, it is believed, is nearly or quite universal practice throughout the country. By a recent decision of the United States Supreme Court, a conductor in such service is also in a sense to be considered as an employee of the foreign road. This is the gist of an opinion by Chief Justice Taft in the suit of Linstead vs. the Chesapeake & Ohio, decided on February 20, 1928.

The sole question before the court was as to whom the man was working for when killed. Linstead was a conductor of the Cleveland, Cincinnati, Chicago & St. Louis and was killed in a collision while his train was moving on the Chesapeake & Ohio. This "train" was simply a string of freight cars being transferred from the yards of the Chesapeake & Ohio, at Stevens, Ky., to the C. C. C. & St. Louis yards at Riverside, Ohio. It appears that the two roads have an unwritten reciprocal arrangement of long standing whereby each freight crew going to the yard of the other road to deliver cars, takes cars from that other road on the return trip. As a matter of convenience and economy each road, on each round trip, performs a service for the other. The decision of the Supreme Court, which reverses one by the circuit court of appeals, sixth circuit, and sustains the opinion of the lower court, holds that the conductor was an employee of the Chesapeake & Ohio within the meaning of the Federal Employers' Liability Act.

Revenues and Expenses for February

The net railway operating income of the 186 Class I railroads in February amounted to $70,064.223, or at the annual rate of return of 4.79 per cent on their property investment, according to reports filed by the carriers with the Bureau of Railway Economics. In February, 1927 the total was $69,516,412, or 4.89 per cent. Operating revenues for the month amounted to $456,593,283 compared with $469,565,403, or a decrease of 2.8 per cent; operating expenses $348,498,198, a decrease of 3.7 per cent. Taxes amounted to $28,868,556, a decrease of 1.4 per cent.

Twenty seven Class I railroads operated at a loss in February of which 12 were in the Eastern district, 3 in the Southern and 12 in the Western district.

For January and February net railway operating income amounted to $126,662,598 (return 4.26 per cent) and for the first two months of 1927 the net was $130,932,678, or 4.52 per cent; operating revenues $914,018,263, (decrease 4.5 per cent) and operating expenses $711,895,814, (decrease 5.1 per cent).

The net railway operating income by districts for the first two months with the percentage of return based on property investment on an annual basis was as follows:

		Per cent
New England Region	$4,698,534	5.36
Great Lakes Region	20,771,397	4.53
Central Eastern Region	25,000,033	4.49
Pocahontas Region	9,426,025	6.39
Total Eastern District	59,895,989	4.79
Total Southern District	18,903,575	3.74
Northwestern Region	9,557,615	2.98
Centralwestern Region	26,114,248	4.57
Southwestern Region	12,191,171	3.76
Total Western District	47,863,034	3.93
United States	$126,662,598	4.26

The net railway operating income for the Class I railroads in the Eastern district for two months totaled $59,895,989, (4.79 per cent) as compared with 5.36 per cent in 1927. Operating revenues $448,743,898, (decrease 7.2 per cent) and operating expenses $354,207,572, (decrease 7.6 per cent).

Class I railroads in the Southern district for two months had a net of $18,903,575, (3.74 per cent) as compared with $21,660,009, or 4.50 per cent, last year. Operating revenues $127,044,320, (decrease 6.1 per cent); operating expenses $98,628,172, (decrease 4.9 per cent).

Class I railroads in the Western district for the first two months had a net of $47,863,034, (3.93 per cent) as compared with $44,058,974 or 3.68 per cent last year. Operating revenues $338,230,045, virtually the same as for the same period last year, and operating expenses $259,060,070, (decrease of 1.4 per cent).

Class I Railroads—United States

	1928	1927
Month of February		
Total operating revenues	$456,593,283	$469,565,403
Total operating expenses	348,498,198	361,844,037
Taxes	28,868,556	29,279,923
Net railway operating income	70,064,223	69,516,412
Operating ratio — per cent	76.33	77.06
Rate of return on property investment	4.79%	4.89%
Two months ended February 29th		
Total operating revenues	$914,018,263	$957,152,423
Total operating expenses	711,895,814	749,834,503
Taxes	57,401,454	58,763,267
Net railway operating income	126,662,598	130,932,678
Operating ratio — per cent	77.89	78.34
Rate of return on property investment	4.26%	4.52%

(*Continued on page 888*)

Revenues and Expenses of Railways

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1928

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1927.
Akron, Canton & Youngstown	Feb.	171	$245,172	$264	$256,323	$46,988	$26,760	$12,629	$74,325	$14,002	$174,704	68.2	$81,619	$68,018	$40,059	$40,226
	2 mos.	171	471,039	538	494,791	81,851	54,324	25,979	149,512	28,870	340,219	68.8	154,572	127,397	74,513	82,647
Atchison, Topeka & Santa Fe	Feb.	9,423	10,450,312	2,968,123	14,619,207	2,224,802	3,283,464	396,163	4,550,458	406,096	10,802,177	73.9	3,817,030	2,568,379	2,590,707	3,359,603
	2 mos.	9,423	20,872,050	6,088,146	29,396,378	4,187,758	6,676,954	852,527	9,466,867	807,984	21,928,259	74.6	7,468,119	4,986,044	5,038,418	6,829,323
Gulf, Colorado & Santa Fe	Feb.	1,944	1,862,261	164,834	2,146,079	520,164	480,911	53,516	739,253	74,748	1,833,999	85.5	312,080	220,487	69,216	360,491
	2 mos.	1,944	3,613,211	372,858	4,220,784	931,775	985,353	114,090	1,511,027	143,750	3,647,522	86.4	573,262	389,548	95,864	1,127,037
Panhandle & Santa Fe	Feb.	964	803,346	95,477	958,270	209,944	250,678	11,059	315,907	25,855	808,564	84.4	149,706	114,030	26,006	250,733
	2 mos.	964	1,566,826	217,874	1,902,858	341,191	483,530	23,307	631,842	53,404	1,527,070	80.3	375,788	307,040	135,174	552,107
Atlanta & West Point	Feb.	93	157,137	56,592	244,980	29,613	40,446	12,934	90,687	12,851	191,352	78.1	53,628	34,820	21,253	21,080
	2 mos.	93	316,339	122,501	500,189	56,722	86,164	26,350	174,399	25,021	378,520	75.7	121,669	87,525	59,108	55,558
Western of Alabama	Feb.	133	177,950	54,688	258,056	31,540	49,738	12,532	80,144	13,769	190,498	73.8	67,558	41,314	61,805	38,933
	2 mos.	133	349,895	118,201	518,271	58,329	101,551	26,235	153,607	28,461	375,172	72.3	143,099	99,964	145,726	81,250
Atlanta, Birmingham & Coast	Feb.	638	310,172	22,708	372,380	89,609	75,746	28,267	153,915	18,273	376,511	101.1	—4,131	—19,185	—33,895	—39,927
	2 mos.	639	645,202	51,003	772,590	180,125	160,657	60,648	322,154	37,211	782,963	101.3	—10,373	—40,509	—68,693	—55,678
Atlantic Coast Line	Feb.	5,104	4,456,217	1,749,115	6,720,782	999,254	1,314,114	172,489	2,281,285	180,894	5,035,425	74.9	1,685,357	1,284,408	1,151,319	1,835,401
	2 mos.	5,104	8,918,475	3,318,279	13,241,658	1,948,508	2,625,898	407,842	4,665,188	367,998	10,175,084	76.8	3,066,574	2,164,299	1,988,047	3,134,172
Charleston & Western Carolina	Feb.	342	245,376	11,063	265,008	82,079	45,337	8,117	100,770	6,809	243,112	91.7	21,896	369	—5,440	40,283
	2 mos.	342	485,258	24,315	526,134	128,303	90,089	15,377	206,739	13,840	454,342	86.4	71,792	28,677	29,735	53,061
Baltimore & Ohio	Feb.	5,637	13,959,585	1,700,351	16,717,509	2,375,115	3,909,806	473,756	6,546,421	670,036	14,134,013	84.6	2,583,496	1,671,868	1,444,068	2,191,497
	2 mos.	5,637	28,513,926	3,728,529	34,366,878	4,750,705	7,907,973	943,379	13,435,339	1,349,065	28,732,316	83.6	5,634,562	3,787,947	3,351,192	5,073,302
Baltimore & Ohio Chicago Term.	Feb.	87	.....	.....	329,182	28,105	36,641	2,510	182,027	15,022	270,736	82.2	58,446	1,606	96,933	76,167
	2 mos.	87	.....	.....	652,951	51,046	76,154	4,957	374,262	31,017	550,131	84.3	102,820	—6,617	156,682	133,768
Staten Island Rapid Transit	Feb.	23	104,477	106,897	230,426	27,141	18,338	2,356	103,360	15,110	166,305	72.2	64,121	45,565	8,430	—7,782
	2 mos.	23	203,076	218,956	461,553	54,834	41,644	4,360	210,545	30,763	342,146	74.1	119,407	83,351	9,719	—15,166
Bangor & Aroostook	Feb.	613	631,402	75,125	728,093	107,805	109,746	4,977	179,243	24,652	429,589	59.0	298,504	240,103	242,252	266,014
	2 mos.	613	1,237,564	151,326	1,434,360	224,005	226,541	10,063	362,898	48,565	877,847	61.2	556,513	438,540	457,679	543,687
Belt Ry. Co. of Chicago	Feb.	32	.....	.....	615,063	47,851	67,760	3,765	326,794	10,562	456,732	74.3	158,331	110,611	147,374	137,675
	2 mos.	32	.....	.....	1,218,404	89,591	147,321	7,294	645,313	21,154	910,673	74.7	307,731	212,295	289,463	278,361
Bessemer & Lake Erie	Feb.	227	575,932	9,757	600,870	66,370	306,386	13,406	234,866	33,755	658,009	109.5	—57,139	—80,889	—55,864	184,206
	2 mos.	227	1,177,485	21,404	1,227,089	128,047	594,080	28,873	479,403	70,129	1,307,237	106.5	—80,148	—127,604	—83,828	334,382
Bingham & Garfield	Feb.	33	37,813	.....	39,122	8,361	8,135	1,230	10,414	4,114	32,377	82.8	6,745	—881	16,630	17,943
	2 mos.	33	75,662	.....	77,901	13,584	16,698	2,938	21,302	8,222	63,032	80.9	14,869	—531	34,103	35,655
Boston & Maine	Feb.	2,112	3 868 989	1,373,829	5.841,407	645,135	1,109,843	71,781	2,297,552	201,074	4,337,573	74.3	1,503,834	1,208,974	1,044,899	749,654
	2 mos.	2,112	7,627,242	2,826,642	11,754,241	1,323,472	2,261,342	146,113	4,729,043	419,089	8,904,680	75.8	2,849,561	2,243,587	1,848,385	1,405,084
Brooklyn Eastern Dist. Term	Feb.	9	110,936	.....	114,712	5.269	9,503	216	42,083	7,396	64,467	56.2	50,245	41,782	41,782	39,452
	2 mos.	9	227,170	.....	235,109	11,519	19,905	1,000	86,677	18,379	137,480	58.5	97,629	81,955	81,955	75,678
Buffalo & Susquehanna	Feb.	253	125,043	1,410	132,454	26,475	48,937	1,718	43,190	7,795	128,115	96.7	4,339	2,339	15,396	28,754
	2 mos.	253	254,928	3,070	270,218	52,989	93,266	3,529	90,840	15,641	256,265	94.8	13,953	9,953	36,189	39,380
Buffalo, Rochester & Pittsburgh	Feb.	601	1,253,138	74,302	1,364,583	118.316	346,104	27,239	547,741	39,106	1,081,485	79.3	283,098	253,083	252,465	246,181
	2 mos.	601	2,514,576	162,931	2,750,693	249,632	722,003	56,097	1,102,654	80,983	2,216,546	80.6	534,147	474,125	482,565	497,259
Canadian Pacific Lines in Maine	Feb.	233	238,340	28,571	281,037	21,225	50,336	5,137	120,888	3,696	201,282	71.6	79,755	65,755	41,548	55,876
	2 mos.	233	495,645	59,690	584,373	44,871	95,032	10,756	244,256	7,481	402,396	68.8	181,977	153,977	105,547	105,794
Canadian Pacific Lines in Vermont	Feb.	85	113,213	35,052	164,027	—13,506	40,315	1,526	110,298	1,910	140,543	85.7	23,484	18,634	—13,810	—7,450
	2 mos.	85	218,466	74,199	326,155	34.131	77,575	3,178	213,552	3,706	332,142	101.8	—5,987	—15,687	—80,487	3,238
Central of Georgia	Feb.	1,911	1,490,809	354,045	2,042,707	260.532	363,712	75,420	787,421	92,735	1,596,071	78.1	446,636	324,759	296,858	437,865
	2 mos.	1,911	2,960,682	703,378	4,062,116	523,560	726,865	149,226	1,600,290	189,320	3,219,672	79.3	842,444	599,619	581,887	821,438
Central New Jersey	Feb.	690	3,195,618	630,859	4,085,175	367.425	890,314	47,113	1,685,035	178,145	3,191,007	78.1	894,168	715,943	572,743	224,020
	2 mos.	690	6,433,625	1,301,302	8,259,065	743,830	1,933,768	91,423	3,467,015	309,456	6,592,909	79.8	1,666,156	1,335,596	1,041,771	594,704
Central Vermont	Feb.	387	270,468	29,340	336,732	366.225	90,088	12,306	228,149	28,292	725,060	215.3	—388,328	—407,339	—414,869	60,507
	2 mos.	366	466,480	54,863	588,071	715,326	189,323	26,625	411.629	49,286	1,392,189	236.7	—804,118	—842,140	—867,399	92,207
Chesapeake & Ohio	Feb.	2,716	8,694,122	518,943	9,571,895	1.529,826	2,424,840	122,473	2,708,565	293,787	7,105,237	74.2	2,466,658	1,796,972	1,987,268	2,774,910
	2 mos.	2,716	17,634,788	1,135,399	19,493,195	2.951.417	4,849,798	262.637	5,613,165	569,835	14,302,485	73.4	5,190,710	3,851,526	4,209,897	5,514,421
Chicago & Alton	Feb.	1,029	1,550.542	456 041	2,204,566	191,741	507,319	77,071	872,447	53,607	1,721,555	78.1	483,011	377,150	177,047	324,444
	2 mos.	1,029	3,074,650	957,086	4,440.625	426,639	1,098.397	153,741	1,790,777	148,086	3,658,447	82.4	782,178	570,753	166,785	580,516
Chicago & Eastern Illinois	Feb.	945	1,612.597	273,109	2,038,907	227.615	442,386	82,539	821,791	68,275	1,656,581	81.2	382,326	266,867	126,599	214,413
	2 mos.	945	3,137,121	602,530	4,040,074	472.782	921.477	165,745	1,692,927	141,978	3,418,608	84.6	621,466	390,876	122,129	441,205
Chicago & Illinois Midland	Feb.	133	212.050	11,460	229,389	16,584	40.583	13,469	64,462	15,403	150,357	65.5	79,032	71,597	75,409	66,479
	2 mos.	133	413,593	22,131	445,913	31,604	85,816	27,109	131,352	30,161	305,906	68.6	140,007	125,137	129,183	128,293
Chicago & North Western	Feb.	8,463	8,175.992	1,672,619	10,973,800	1,136,354	2,432,648	193,522	4.609,781	351.216	8,747,437	79.7	2,226,363	1,450,495	1,275,632	1,087,355
	2 mos.	8,463	15,529,010	3,647,718	21,396,102	2.309 367	4,647,345	396,674	9,274,121	717,780	17,432,062	81.5	3,964,040	2,411,411	2,162,960	1,638,205
Chicago, Burlington & Quincy	Feb.	9,377	9.976,607	1,446,077	12,513,506	1,099,512	1,897,032	268,149	4,213,223	357.618	7.935,175	63.4	4.578,331	3.567 667	3.220.930	2.284,628
	2 mos.	9,377	19,787,767	3,145,115	25,165,642	2,341,348	4,082.127	509,780	8,844,801	729,783	16,719,626	66.4	8,446,016	6,576,068	5,899,287	4,191,385

Revenues and Expenses of Railways

Revenues and Expenses of Railways

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1927.
Chicago Great Western	Feb.	1,495	$1,462,772	$237,219	$1,850,247	$170,907	$354,900	$77,495	$795,265	$53,445	$1,463,356	79.1	$386,891	$297,410	$146,740	$97,666
	2 mos.	1,495	2,857,802	504,199	3,655,614	351,604	743,874	157,096	1,654,374	108,881	3,038,441	83.1	617,173	444,011	134,158	173,199
Chicago, Indianapolis & Louisville	Feb.	647	1,149,060	154,907	1,432,347	117,281	321,709	38,524	559,925	34,651	1,085,296	75.8	347,051	271,178	144,321	179,369
	2 mos.	647	2,227,170	350,317	2,837,203	243,738	638,858	76,942	1,127,701	74,033	2,190,078	77.2	647,125	506,549	260,244	302,680
Chicago, Milwaukee, St. P. & Pacific	Feb.	11,252	10,341,715	1,302,260	12,695,600	1,123,617	2,374,850	211,009	4,625,913	324,802	8,740,588	68.8	3,955,012	3,204,953	2,798,980	954,792
	2 mos.	11,252	19,558,925	2,884,273	24,663,211	2,370,635	5,055,063	499,988	9,775,428	685,972	18,552,399	75.2	6,110,812	4,608,435	3,771,382	1,472,999
Chicago River & Indiana	Feb.	20	.....	.....	567,617	49,011	62,464	796	213,631	13,799	339,701	59.8	227,916	177,455	276,248	258,323
	2 mos.	20	.....	.....	1,119,612	98,183	135,101	1,623	428,486	33,330	696,723	62.2	422,889	326,558	523,216	510,262
Chicago, Rock Island & Pacific	Feb.	7,569	7,725,610	1,487,063	10,074,729	1,262,358	1,992,271	238,037	3,796,083	347,099	7,551,075	75.0	2,523,654	1,886,363	1,513,651	1,291,089
	2 mos.	7,569	15,215,236	3,205,831	20,170,228	2,594,500	4,052,876	471,815	7,796,008	677,366	15,515,337	76.9	4,654,891	3,396,334	2,606,457	2,268,742
Chicago, Rock Island & Gulf	Feb.	516	422,275	70,715	534,022	60,712	47,059	19,105	189,244	17,453	333,911	62.5	200,111	172,266	148,680	161,219
	2 mos.	516	831,479	141,684	1,046,720	105,141	99,755	38,228	389,313	34,119	644,263	61.5	402,457	350,842	295,839	382,287
Chic., St. Paul, Minn. & Omaha	Feb.	1,746	1,654,597	315,359	2,118,124	264,101	409,468	37,017	946,507	73,617	1,737,580	82.0	380,544	270,521	211,976	163,882
	2 mos.	1,746	3,234,620	684,021	4,222,961	533,888	856,506	77,014	1,994,979	149,892	3,626,345	85.9	596,616	377,169	260,550	222,840
Clinchfield	Feb.	309	543,101	17,389	570,848	71,172	118,847	21,972	124,671	18,916	354,899	62.2	215,949	140,910	214,339	285,639
	2 mos.	309	1,091,384	36,961	1,151,740	128,002	243,555	45,341	255,494	36,925	708,845	61.5	442,895	292,812	444,215	592,273
Colorado & Southern	Feb.	1,052	773,987	81,092	928,925	194,392	206,943	15,963	335,134	40,200	794,420	85.5	134,505	64,950	74,172	31,384
	2 mos.	1,052	1,690,081	175,232	2,012,908	333,088	412,146	28,430	719,513	81,933	1,583,226	78.7	429,682	296,797	256,935	231,459
Ft. Worth & Denver City	Feb.	533	666,775	146,193	868,745	149,868	124,278	16,074	263,403	36,430	592,394	68.2	276,351	237,122	239,755	245,856
	2 mos.	533	1,386,762	316,169	1,812,239	259,521	242,981	32,949	552,993	75,327	1,170,734	64.6	641,505	543,733	539,268	650,600
Wichita Valley	Feb.	271	123,940	12,303	144,324	23,581	6,318	33	40,389	1,535	71,818	49.8	72,506	65,586	42,652	70,067
	2 mos.	271	258,367	26,549	300,144	45,791	15,587	50	85,148	3,357	149,838	49.9	150,306	133,625	83,510	150,597
Columbus & Greenville	Feb.	167	118,757	15,905	140,952	38,765	17,671	4,208	50,380	10,492	121,516	86.2	19,436	18,218	5,335	3,679
	2 mos.	167	237,571	39,757	291,384	73,870	35,029	8,936	105,651	27,979	251,464	86.3	39,920	37,498	11,968	6,053
Conemaugh & Black Lick	Feb.	23	48,919	.....	106,977	13,437	27,792	925	73,974	2,967	119,095	111.3	—12,118	—13,118	—12,593	—10,313
	2 mos.	23	99,783	.....	217,094	25,699	53,326	1,886	149,659	5,994	236,564	109.0	—19,470	—21,470	—21,640	—23,239
Delaware & Hudson	Feb.	881	2,518,392	257,845	2,973,904	387,295	790,713	49,806	1,188,855	153,956	2,585,766	86.9	388,138	300,439	304,327	339,401
	2 mos.	881	4,912,854	557,344	5,905,041	881,068	1,642,706	99,933	2,394,896	345,934	5,391,036	91.3	514,005	337,276	324,236	476,267
Delaware, Lackawanna & Western	Feb.	998	4,365,674	892,385	5,928,949	601,115	1,123,581	133,144	2,572,502	170,687	4,651,587	78.5	1,277,362	770,462	798,498	761,428
	2 mos.	998	8,768,314	1,894,366	12,031,555	1,205,522	2,262,691	261,537	5,215,887	352,489	9,404,777	78.2	2,626,778	1,607,648	1,657,954	1,302,510
Denver & Rio Grande Western	Feb.	2,547	1,881,729	233,143	2,273,142	386,946	493,562	53,384	720,565	83,557	1,763,286	77.6	509,856	324,814	379,139	407,866
	2 mos.	2,547	4,150,454	488,444	4,957,878	808,554	1,023,787	110,609	1,561,404	171,749	3,727,474	75.2	1,230,404	860,348	986,488	1,023,691
Denver & Salt Lake	Feb.	252	257,669	29,876	302,061	44,348	96,682	2,057	64,424	8,556	216,067	71.5	85,994	78,989	85,329	33,649
	2 mos.	253	682,954	56,909	768,133	97,239	202,228	3,609	180,429	17,937	501,442	65.3	266,691	252,684	252,628	108,169
Detroit & Mackinac	Feb.	315	80,297	10,920	99,499	15,482	23,665	2,156	40,841	5,276	87,418	87.9	12,031	2,086	6,002	—1,223
	2 mos.	315	156,792	26,752	199,087	31,314	50,949	3,933	83,545	10,875	180,594	90.7	18,493	—1,417	6,335	—10,214
Detroit & Toledo Shore Line	Feb.	50	440,428	.....	445,091	24,644	36,633	3,300	109,158	7,008	180,743	40.6	264,348	233,128	145,300	194,363
	2 mos.	50	814,344	.....	823,043	46,093	70,158	6,776	206,326	14,457	343,810	41.8	479,233	418,863	250,856	336,128
Detroit Terminal	Feb.	19	.....	.....	160,051	11,425	15,589	25	78,521	4,027	109,587	68.5	50,464	34,774	35,312	35,348
	2 mos.	19	.....	.....	300,332	33,254	30,035	25	148,833	7,199	219,346	73.0	80,986	51,680	52,680	46,076
Detroit, Toledo & Ironton	Feb.	495	703,827	3,314	714,725	83,476	160,190	12,449	249,266	27,055	532,427	74.5	182,298	141,097	88,284	128,655
	2 mos.	495	1,384,372	7,220	1,414,260	198,485	302,354	25,109	510,370	57,415	1,093,199	77.3	321,061	231,629	112,390	269,109
Duluth & Iron Range	Feb.	275	96,835	5,263	114,495	54,120	97,889	1,408	94,829	21,596	269,842	235.7	—155,347	—175,943	—179,165	—185,597
	2 mos.	275	169,816	11,156	205,326	108,822	195,199	2,989	187,256	40,119	534,385	260.3	—329,059	—369,172	—374,528	—398,316
Duluth, Missabe & Northern	Feb.	307	87,045	4,848	108,453	75,850	155,813	2,829	131,231	23,813	389,536	359.2	—281,083	—358,908	—359,931	—466,682
	2 mos.	307	147,618	10,740	189,016	149,718	311,270	6,210	261,673	46,599	775,470	410.3	—586,454	—740,795	—746,345	—929,429
Duluth, Winnipeg & Pacific	Feb.	178	232,964	14,422	251,642	24,812	46,953	4,407	83,314	7,155	167,586	66.6	84,056	71,474	66,738	49,517
	2 mos.	178	441,636	26,085	476,298	50,172	95,029	9,071	169,942	15,409	341,578	71.7	134,720	110,879	104,502	101,350
Elgin, Joliet & Eastern	Feb.	460	1,836,036	2	2,025,629	154,055	409,088	14,661	737,551	74,094	1,387,819	68.5	637,810	534,610	370,577	667,368
	2 mos.	460	3,552,225	23	3,921,934	320,091	807,385	29,442	1,470,000	126,755	2,750,803	70.1	1,171,131	964,784	649,308	1,024,118
Erie Railroad	Feb.	2,047	6,600,046	783,715	8,010,765	896,100	1,937,348	170,801	3,391,215	293,068	6,724,131	83.9	1,286,634	922,452	821,380	590,544
	2 mos.	2,047	13,046,521	1,660,383	15,968,758	1,770,951	3,981,592	341,204	6,918,567	582,148	13,679,531	85.7	2,289,227	1,547,424	1,360,825	900,721
Chicago & Erie	Feb.	269	1,080,182	35,978	1,194,344	162,880	146,634	29,269	360,312	41,569	739,478	61.9	454,866	403,162	120,049	77,460
	2 mos.	269	1,966,523	77,963	2,191,491	304,578	307,198	53,978	747,875	82,314	1,494,739	68.2	696,752	593,398	2,559	4,873
New Jersey & New York	Feb.	45	25,360	91,265	121,111	14,949	21,762	1,754	72,014	3,455	113,879	94.0	7,232	3,330	—28,192	—33,573
	2 mos.	45	51,062	186,090	245,252	30,143	52,505	3,277	143,699	6,940	236,509	96.4	8,743	939	—64,166	—73,589
N. Y., Susquehanna & Western	Feb.	134	291,434	43,095	376,592	49,537	58,572	4,963	196,133	11,173	320,328	85.1	56,264	26,862	—3,743	—23,252
	2 mos.	134	571,003	87,840	747,555	98,701	123,759	10,237	399,455	22,178	654,244	87.5	93,311	34,557	—30,015	—46,884
Evansville, Indianapolis & Terre Haute	Feb.	146	152,976	4,518	162,513	15,618	21,519	2,595	54,235	5,508	99,423	61.2	63,090	56,934	13,910	51,542
	2 mos.	146	318,811	8,806	337,964	37,427	47,335	4,982	120,843	11,530	222,033	65.7	115,931	103,695	27,140	70,043
Florida East Coast	Feb.	858	726,698	789,683	1,688,481	202,753	213,371	38,432	447,896	40,794	972,874	57.6	715,607	566,414	493,688	495,641
	2 mos.	858	1,449,794	1,335,852	3,109,275	407,827	417,159	100,531	933,154	96,684	2,019,750	65.0	1,089,525	792,338	644,127	628,532

Revenues and Expenses of Railways

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1927.
Fort Smith & Western	Feb.	249	$97,701	$9,300	$112,714	$21,501	$23,580	$5,530	$42,565	$6,579	$99,066	87.9	$13,648	$10,640	$1,172	$8,542
	2 mos.	249	204,402	20,704	239,590	41,767	55,359	11,292	88,426	13,652	209,458	87.4	30,132	21,613	2,990	19,867
Galveston Wharf	Feb.	13	.....	.....	133,183	44,758	3,805	2,684	29,515	3,782	93,496	70.2	39,687	22,687	22,745	49,700
	2 mos.	13	.....	.....	268,097	92,347	7,885	5,251	54,752	9,309	188,114	70.2	79,983	45,983	46,081	121,456
Georgia R. R.	Feb.	328	320,293	50,918	400,352	46,390	79,004	24,059	190,729	23,747	363,637	90.8	36,715	27,902	40,003	66,209
	2 mos.	328	633,372	112,178	801,042	83,534	161,207	49,475	382,264	47,972	721,776	90.1	79,266	61,873	89,631	134,121
Georgia & Florida	Feb.	445	109,082	11,592	127,899	17,132	18,240	9,368	50,927	8,168	103,856	81.2	24,043	16,037	17,207	23,696
	2 mos.	445	200,930	23,379	238,716	34,014	36,883	18,503	101,642	16,433	207,717	87.0	30,999	14,981	19,072	40,619
Grand Trunk Western	Feb.	345	1,381,173	149,565	1,617,159	106,188	382,807	39,695	592,170	64,012	1,199,140	74.2	418,019	335,608	264,231	270,416
	2 mos.	345	2,692,864	319,366	3,182,350	239,309	760,178	81,640	1,186,673	132,095	2,430,918	76.4	751,432	586,621	480,685	458,753
Atlantic & St. Lawrence	Feb.	166	192,463	28,494	236,391	27,471	42,932	5,369	130,034	8,543	216,348	91.5	20,043	5,143	—67,677	—30,526
	2 mos.	166	409,257	64,736	514,000	62,383	94,262	11,028	298,554	17,908	487,290	94.8	26,710	—1,140	—145,286	—79,747
Chicago, Det. & Canada Gr. Tr. Jct.	Feb.	59	245,564	521	280,754	17,308	17,050	4,475	94,009	4,335	137,175	48.9	143,579	133,170	98,936	107,479
	2 mos.	59	500,140	1,640	571,225	32,424	33,721	9,254	187,368	8,985	271,736	47.6	299,489	278,680	203,729	280,000
Detroit, Grand Haven & Mil.	Feb.	192	613,452	24,773	678,932	48,700	64,331	12,582	267,142	18,865	411,682	60.6	267,250	256,341	133,847	77,041
	2 mos.	192	1,135,775	51,481	1,270,418	96,062	127,083	25,952	525,184	39,253	813,512	64.0	456,906	435,097	177,528	168,397
Great Northern	Feb.	8,163	5,919,950	843,669	7,453,720	693,869	1,528,220	204,841	2,908,661	229,861	5,642,309	75.7	1,811,411	1,147,573	1,098,852	572,580
	2 mos.	8,163	11,161,446	1,865,139	14,395,506	1,509,084	3,082,205	398,456	5,894,130	468,672	11,504,208	79.9	2,891,298	1,566,536	1,475,453	874,859
Green Bay & Western	Feb.	234	115,734	5,296	127,944	15,198	17,304	5,107	55,013	2,890	95,512	74.7	32,432	24,331	20,098	14,406
	2 mos.	234	233,661	12,013	258,047	33,258	35,223	9,844	109,275	6,161	193,761	75.1	64,286	48,185	39,237	34,937
Gulf & Ship Island	Feb.	307	242,855	43,528	310,376	48,736	55,936	5,497	104,427	8,674	227,276	73.2	83,100	56,246	38,542	—17,457
	2 mos.	307	460,847	85,061	595,826	122,068	104,169	11,117	214,343	16,901	475,979	79.9	119,847	66,676	40,050	—58,768
Gulf, Mobile & Northern	Feb.	733	519,433	28,201	567,398	97,107	91,990	31,628	191,482	25,788	438,167	77.22	129,231	108,369	71,740	84,205
	2 mos.	733	1,027,740	63,091	1,134,802	186,948	185,016	63,993	377,577	54,575	868,530	76.54	266,272	214,234	143,671	185,282
Hocking Valley	Feb.	348	1,127,456	57,496	1,264,040	188,493	308,854	15,821	428,365	51,464	992,993	78.6	271,047	145,997	165,772	305,123
	2 mos.	348	2,237,833	123,157	2,518,947	357,852	627,232	34,427	859,535	95,641	1,974,607	78.4	544,340	294,312	347,197	522,630
Illinois Central	Feb.	4,915	9,503,616	1,950,658	12,205,989	1,310,076	2,803,396	282,733	4,474,716	346,503	9,310,966	76.3	2,895,023	2,051,172	2,102,355	2,307,340
	2 mos.	4,915	18,960,741	4,049,344	24,512,215	2,687,095	5,610,315	573,813	9,263,775	703,357	19,015,652	77.6	5,496,563	3,810,795	3,970,829	4,270,998
Yazoo & Mississippi Valley	Feb.	1,709	1,687,495	277,587	2,096,824	354,367	407,217	48,002	821,955	62,667	1,701,639	81.2	395,185	229,499	154,133	200,904
	2 mos.	1,709	3,408,287	603,120	4,272,856	743,033	781,085	90,958	1,716,331	126,703	3,465,277	81.1	807,579	476,316	337,970	479,808
Illinois Central System	Feb.	6,624	11,200,538	2,231,878	14,315,876	1,664,443	3,217,972	330,735	5,309,846	409,316	11,033,285	77.1	3,282,591	2,268,311	2,255,487	2,516,542
	2 mos.	6,624	22,388,856	4,660,538	28,812,978	3,430,128	6,403,217	664,771	11,006,866	830,248	22,519,694	78.2	6,293,284	4,266,552	4,312,549	4,767,522
Kansas City, Mexico & Orient	Feb.	272	229,671	4,835	241,585	55,964	50,399	9,433	76,967	9,988	202,114	83.7	39,471	35,461	48,444	—5,695
	2 mos.	272	463,806	10,239	489,238	111,220	104,284	17,174	162,751	19,036	413,759	84.6	75,479	67,414	96,575	—9,030
Kansas City, Mex. & Orient of Tex.	Feb.	465	470,810	14,865	497,951	150,418	81,640	9,993	137,577	11,623	391,810	78.7	106,141	99,088	38,807	4,239
	2 mos.	465	934,971	31,545	992,641	276,331	179,009	18,480	297,372	21,928	793,925	80.0	198,716	184,236	59,999	41,014
Kansas City Southern	Feb.	784	1,268,720	76,355	1,488,428	144,565	242,116	54,262	464,936	77,672	982,147	66.0	506,281	391,893	328,271	297,360
	2 mos.	784	2,453,723	162,362	2,896,533	300,673	498,537	109,058	949,916	156,997	2,013,900	69.5	882,633	654,170	539,875	596,367
Texarkana & Ft. Smith	Feb.	81	178,844	7,399	203,588	22,209	25,503	6,884	63,869	10,015	130,458	64.1	73,130	60,963	37,930	40,958
	2 mos.	81	377,235	14,936	425,361	40,108	39,464	12,661	128,672	19,639	243,096	57.2	182,265	157,927	102,504	84,818
Kansas, Oklahoma & Gulf	Feb.	326	244,686	3,063	252,532	54,304	20,792	12,306	64,338	9,652	154,494	61.2	98,038	87,455	75,861	—33,725
	2 mos.	326	480,596	6,961	497,873	109,236	43,389	22,634	132,510	19,174	313,496	63.0	184,377	163,164	138,060	—89,793
Lake Superior & Ishpeming	Feb.	160	67,318	2,226	73,313	25,369	27,584	454	34,498	5,009	92,914	126.7	—19,601	—31,910	—35,999	—37,936
	2 mos.	160	132,978	4,870	145,477	51,908	54,515	1,123	69,134	11,669	188,349	129.5	—42,872	—67,536	—76,223	—83,522
Lake Terminal	Feb.	13	.....	.....	73,161	13,389	22,452	.....	47,832	1,701	85,374	116.7	—12,213	—14,989	—10,756	14,534
	2 mos.	13	.....	.....	147,066	28,205	40,972	.....	97,575	4,216	170,968	116.3	—23,902	—31,203	—22,685	3,440
Lehigh & Hudson River	Feb.	96	204,341	1,486	216,904	19,269	39,619	2,369	87,622	9,625	158,504	73.1	58,400	45,481	24,857	39,678
	2 mos.	96	413,259	3,196	438,742	44,616	82,377	4,829	176,199	19,397	327,418	74.6	111,324	86,455	43,295	76,054
Lehigh & New England	Feb.	216	365,908	1,825	373,564	38,519	85,972	4,737	142,991	17,776	289,970	77.6	83,594	14,295	73,936	66,842
	2 mos.	216	703,847	3,470	719,114	73,986	176,995	10,508	326,909	36,214	624,426	86.8	94,688	78,465	81,244	145,253
Lehigh Valley	Feb.	1,363	4,130,072	513,901	5,011,102	467,057	1,246,510	139,174	2,389,182	140,846	4,414,437	88.1	596,665	375,023	231,419	486,517
	2 mos.	1,363	8,298,470	1,080,517	10,131,261	1,245,605	2,609,214	274,326	4,890,222	281,129	9,364,154	92.4	767,107	397,344	78,935	645,412
Louisiana & Arkansas	Feb.	302	298,909	9,146	316,326	47,168	52,223	10,884	86,162	10,035	206,122	65.2	110,204	76,118	59,152	39,767
	2 mos.	302	559,770	19,688	592,979	86,209	107,476	22,149	166,540	20,985	401,854	67.8	191,125	130,810	105,050	61,334
Louisiana Ry. & Nav. Co.	Feb.	334	245,541	9,166	264,529	51,781	33,663	13,123	101,511	11,191	209,832	79.3	54,697	31,638	5,964	—7,262
	2 mos.	334	497,177	18,774	536,156	116,383	71,173	25,382	223,496	22,072	455,041	84.9	81,115	35,044	—25,486	—40,985
Louisiana Ry. & Nav. Co. of Tex.	Feb.	206	83,412	2,950	91,255	20,209	12,796	4,314	39,784	5,947	83,050	91.0	8,205	4,199	—9,229	—4,414
	2 mos.	206	162,303	7,247	177,528	42,087	22,730	6,040	82,011	11,036	163,904	92.3	13,624	5,582	—21,170	—28,560
Louisville & Nashville	Feb.	5,077	8,914,374	1,469,585	11,035,246	1,628,082	2,582,876	245,440	4,032,331	322,096	8,883,374	80.5	2,151,872	1,571,896	1,545,578	1,664,516
	2 mos.	5,077	17,824,662	3,064,169	22,176,261	3,228,822	5,191,685	581,051	8,162,734	666,524	17,942,336	80.9	4,233,925	3,066,994	3,048,627	3,236,546
Louisville, Henderson & St. Louis	Feb.	199	240,099	39,168	295,466	50,206	40,978	8,943	109,122	11,279	222,003	75.1	73,463	49,596	39,040	84,146
	2 mos.	199	479,851	83,875	597,043	101,938	96,681	17,060	223,303	22,674	465,090	77.9	131,953	85,683	66,637	161,415

Revenues and Expenses of Railways

		199	240,099	39,168	295,466	50,206	40,978	581,051	8,162,734	666,524	17,942,336	80.5	2,151,872	1,571,896	1,545,578	1,664,516	923
	2 mos.	199	479,851	83,875	597,043	101,938	96,681	8,943	109,122	11,279	222,003	80.9	4,233,925	3,066,994	3,048,627	3,236,546	
								17,060	223,303	22,674	465,090	75.1	73,463	49,596	39,040	84,146	
												77.9	131,953	85,683	66,637	161,415	

Revenues and Expenses of Railways

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1927.
Maine Central	Feb.	1,122	$1,306,356	$247,541	$1,682,881	$202,401	$284,675	$14,050	$674,192	$47,975	$1,223,383	72.7	$459,498	$354,618	$295,375	$228,435
	2 mos.	1,122	2,509,587	527,856	3,288,922	423,920	581,283	27,034	1,354,466	102,405	2,488,959	75.7	799,963	590,158	479,078	492,596
Midland Valley	Feb.	364	236,372	15,987	261,316	26,382	30,241	7,890	73,650	13,198	148,315	56.8	113,001	95,522	68,141	85,751
	2 mos.	364	493,656	35,127	549,151	61,048	62,109	15,408	153,560	26,717	313,608	57.1	235,543	200,670	144,798	201,015
Minneapolis & St. Louis	Feb.	1,627	1,001,220	78,044	1,137,727	95,798	236,194	35,562	527,248	43,233	935,838	82.3	201,889	142,230	80,180	19,793
	2 mos.	1,627	1,886,850	165,356	2,167,783	205,243	477,293	73,758	1,094,331	88,957	1,937,267	89.4	230,516	109,335	—13,930	—63,805
Minneapolis, St. Paul & S. S. Marie	Feb.	4,385	2,685,337	356,682	3,279,028	407,890	707,635	66,889	1,434,541	123,539	2,754,893	84.0	524,135	324,215	221,885	174,522
	2 mos.	4,385	5,292,862	825,042	6,583,413	866,101	1,418,189	148,088	2,933,146	238,913	5,629,424	85.5	953,989	538,205	313,098	282,734
Duluth, South Shore & Atlantic	Feb.	582	320,824	56,705	400,901	49,126	66,896	7,005	183,519	9,841	320,445	79.9	80,456	50,456	31,628	—1,401
	2 mos.	582	628,102	132,804	809,837	95,849	138,257	16,970	365,410	21,411	646,646	79.8	163,191	103,191	63,849	13,889
Spokane International	Feb.	165	73,143	8,983	88,093	16,145	6,098	3,274	31,368	6,745	64,721	73.5	23,372	17,854	10,938	10,351
	2 mos.	165	147,030	19,847	179,642	33,524	15,495	6,707	66,643	13,265	137,826	76.7	41,816	30,825	17,813	26,257
Mississippi Central	Feb.	161	128,218	7,051	139,223	16,905	21,466	8,936	34,800	7,645	89,752	64.5	49,471	39,530	35,287	27,831
	2 mos.	161	240,723	15,133	264,802	31,989	44,050	17,948	71,098	16,022	181,107	68.4	83,695	66,191	60,995	60,967
Missouri & North Arkansas	Feb.	364	121,508	10,280	138,702	28,816	27,518	11,863	60,351	8,559	136,727	98.6	1,975	—381	—12,238	11,554
	2 mos.	364	224,287	23,064	261,776	62,162	53,302	21,418	121,990	17,089	275,581	105.3	—13,805	—18,521	—41,870	8,491
Missouri-Kansas-Texas	Feb.	1,799	2,208,241	261,335	2,662,006	263,259	513,639	62,975	698,985	94,991	1,644,649	61.8	1,017,357	800,563	775,361	777,222
	2 mos.	1,799	4,309,694	595,386	5,289,098	527,824	1,109,568	132,478	1,456,754	193,784	3,440,847	65.1	1,848,251	1,445,728	1,406,251	1,524,132
Missouri-Kansas-Texas of Texas	Feb.	1,389	1,121,949	263,526	1,517,475	222,645	296,322	46,542	647,603	62,963	1,292,803	85.2	224,672	172,397	51,515	199,649
	2 mos.	1,389	2,255,058	570,044	3,090,018	434,667	555,017	97,222	1,321,097	128,122	2,568,086	83.1	521,932	415,067	153,134	478,579
Missouri Pacific	Feb.	7,396	8,187,216	1,114,087	10,085,676	1,237,561	1,995,957	300,728	3,652,677	361,233	7,534,777	74.7	2,550,899	2,077,496	1,657,563	1,580,362
	2 mos.	7,396	16,315,738	2,342,780	20,224,274	2,526,589	4,045,092	587,836	7,651,584	747,028	15,510,097	76.7	4,714,177	3,810,814	3,019,743	3,102,463
Gulf Coast Lines	Feb.	1,007	1,128,893	150,136	1,352,042	234,951	203,085	40,570	412,159	57,456	932,224	68.95	419,818	366,827	264,523	253,629
	2 mos.	1,007	2,087,164	298,394	2,518,889	457,756	413,362	79,889	804,157	112,896	1,856,362	73.70	662,527	558,940	394,937	499,574
International-Great Northern	Feb.	1,159	1,124,862	178,554	1,427,568	242,100	244,931	35,855	600,082	72,962	1,196,941	83.84	230,627	188,509	112,846	113,258
	2 mos.	1,159	2,170,055	379,288	2,785,165	474,008	513,035	72,667	1,215,885	138,665	2,411,764	86.59	373,401	290,403	154,521	274,108
San Antonio, Uvalde & Gulf	Feb.	318	143,890	19,862	177,557	36,575	22,624	5,326	49,016	7,271	121,035	68.2	56,522	52,812	23,479	21,767
	2 mos.	318	253,384	38,608	317,129	67,663	43,096	10,506	95,790	14,736	233,004	73.5	84,125	76,679	25,977	27,977
Texas & Pacific	Feb.	2,014	3,056,802	475,422	3,767,630	530,053	645,713	72,303	1,278,243	102,482	2,644,354	70.2	1,123,276	964,311	686,977	460,982
	2 mos.	2,041	5,947,175	987,351	7,377,756	1,046,116	1,312,389	147,592	2,561,941	209,767	5,298,352	71.8	2,079,404	1,762,198	1,228,103	815,091
Mobile & Ohio	Feb.	1,161	1,224,454	91,615	1,390,330	200,764	257,729	64,369	513,537	46,552	1,080,419	77.7	309,911	226,817	174,899	141,396
	2 mos.	1,161	2,384,850	195,130	2,726,624	405,854	526,467	115,529	1,042,760	94,590	2,180,884	80.0	545,740	379,126	272,283	298,953
Monongahela	Feb.	171	530,621	18,218	553,713	85,000	82,000	966	155,406	10,056	333,313	60.2	220,400	203,210	109,202	172,903
	2 mos.	171	1,099,139	38,626	1,148,311	170,000	164,000	2,125	318,220	20,456	674,686	58.8	473,625	435,117	246,066	394,540
Monongahela Connecting	Feb.	7	.....	.....	140,772	16,577	29,646	374	69,929	3,352	119,878	85.2	20,894	14,968	15,419	28,688
	2 mos.	7	.....	.....	294,304	31,779	62,598	789	143,886	6,623	245,675	83.5	48,629	35,290	36,732	55,091
Montour	Feb.	56	118,758	.....	119,053	9,674	38,388	1,077	30,704	6,603	86,446	72.6	32,607	31,107	52,180	40,547
	2 mos.	56	232,293	5	233,227	20,967	75,027	2,414	65,378	13,563	177,349	76.0	55,878	52,878	91,623	94,145
Nashville, Chatt. & St. Louis	Feb.	1,259	1,328,158	279,689	1,777,261	251,594	413,220	93,633	674,317	76,516	1,517,680	85.4	259,581	184,118	197,617	232,899
	2 mos.	1,259	2,566,562	595,009	3,463,693	498,694	847,502	192,318	1,346,239	155,069	3,061,595	88.4	402,098	251,613	279,329	454,338
Nevada Northern	Feb.	165	59,210	5,172	71,610	11,080	9,147	943	14,422	4,295	40,037	55.9	31,573	20,863	21,837	39,174
	2 mos.	165	121,100	10,562	145,554	24,621	19,412	1,943	29,843	8,707	84,979	58.4	60,575	39,155	40,813	71,541
Newburgh & South Shore	Feb.	6	.....	.....	149,718	14,243	41,621	.....	59,244	4,301	119,409	79.8	30,309	17,577	31,860	16,397
	2 mos.	6	.....	.....	248,415	22,874	77,137	.....	118,840	8,569	227,420	91.6	20,995	—2,947	15,995	20,558
New Orleans Great Northern	Feb.	276	252,134	18,429	278,360	34,553	48,658	13,321	81,242	11,276	189,195	68.0	89,165	71,572	51,842	53,475
	2 mos.	276	503,632	38,150	558,842	67,898	87,021	26,663	168,276	22,670	373,016	66.8	185,826	147,672	111,078	98,574
New Orleans Terminal	Feb.	20	1,359	.....	140,581	27,085	6,420	.....	52,007	1,919	87,431	62.2	53,150	42,099	35,192	27,137
	2 mos.	20	3,849	.....	271,842	57,814	15,632	.....	108,460	3,621	185,527	68.2	86,315	64,260	52,901	54,148
New York Central	Feb.	6,906	17,853,346	6,930,120	28,301,895	3,383,067	6,381,340	418,754	10,585,743	1,135,564	22,353,408	79.0	5,948,489	3,910,107	3,639,908	3,976,977
	2 mos.	6,906	34,690,959	15,157,356	56,965,693	6,903,983	12,337,979	868,367	21,719,363	2,311,080	45,076,048	79.1	11,889,645	7,802,608	7,269,483	7,745,340
Cincinnati Northern	Feb.	244	324,195	4,264	334,025	34,138	67,514	6,659	104,153	9,001	221,398	66.3	112,627	88,116	55,302	79,635
	2 mos.	244	628,654	9,473	648,589	72,850	139,965	12,973	224,380	18,522	468,623	72.3	179,966	138,434	59,479	117,938
Cleve., Cinn., Chicago & St. Louis	Feb.	2,396	5,270,100	1,058,726	6,882,715	623,499	1,481,839	151,151	2,646,289	241,165	5,220,406	75.8	1,662,309	1,232,200	1,125,077	1,152,137
	2 mos.	2,396	10,473,530	2,386,580	13,954,495	1,311,683	3,106,662	312,991	5,517,477	531,346	10,940,430	78.4	3,014,065	2,201,285	1,894,365	2,045,440
Indiana Harbor Belt	Feb.	130	.....	.....	965,787	96,538	125,578	4,585	457,254	24,912	723,597	74.9	242,190	196,534	141,161	126,361
	2 mos.	130	.....	.....	1,901,379	205,460	239,678	10,092	903,904	52,660	1,439,665	75.7	461,714	370,206	278,238	187,985
Michigan Central	Feb.	1,858	5,054,301	1,344,890	7,061,046	625,063	1,340,496	120,114	2,427,742	195,617	4,823,304	67.3	2,237,742	1,746,498	1,612,475	1,596,521
	2 mos.	1,858	9,613,764	3,084,170	13,974,714	1,354,998	2,648,531	258,908	4,869,703	447,719	9,804,096	70.2	4,170,618	3,217,347	2,987,998	2,865,734
Pittsburgh & Lake Erie	Feb.	231	2,109,601	197,012	2,379,840	245,564	752,763	28,376	807,562	80,751	1,919,841	80.7	459,999	296,999	593,267	602,257
	2 mos.	231	4,118,658	412,490	4,678,321	548,201	1,513,855	57,930	1,653,772	157,480	3,938,532	84.2	739,789	424,788	1,026,826	1,218,778
New York, Chicago & St. Louis	Feb.	1,690	3,976,787	103,473	4,197,394	478,611	796,521	125,058	1,542,421	140,262	3,075,461	73.3	1,121,933	845,445	552,585	544,700
	2 mos.	1,690	7,995,720	222,965	8,446,187	922,189	1,611,506	266,211	3,127,630	298,845	6,215,802	73.6	2,230,385	1,677,474	1,123,010	1,009,542

Revenues and Expenses of Railways

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1927.
N. Y., New Haven & Hartford	Feb.	2,157	$5,318,297	$3,573,344	$10,002,594	$1,246,954	$2,034,652	$88,198	$3,696,822	$319,181	$7,563,189	75.6	$2,439,405	$1,778,628	$1,284,818	$1,073,820
	2 mos.	2,162	10,577,045	7,487,682	20,303,713	2,781,422	4,025,648	189,109	7,468,866	626,274	15,444,036	76.1	4,859,677	3,577,994	2,603,057	1,870,727
New York Connecting	Feb.	20	230,801	.....	255,833	26,358	11,432	.....	53,963	2,065	93,818	36.7	162,015	122,515	102,548	89,653
	2 mos.	20	445,526	.....	495,935	46,706	34,240	.....	99,790	3,636	184,372	37.2	311,563	232,563	189,876	169,880
New York, Ontario & Western	Feb.	569	489,260	61,157	702,085	94,099	129,063	18,684	432,210	33,316	716,983	102.1	—14,898	—64,926	—104,672	—159,352
	2 mos.	569	1,031,066	134,606	1,482,459	200,511	298,882	37,457	873,814	72,982	1,501,579	101.3	—19,120	—119,369	—205,187	—367,351
Norfolk & Western	Feb.	2,241	6,966,010	425,841	7,695,817	1,152,060	1,593,071	109,070	2,169,788	245,501	5,267,839	68.5	2,427,978	1,627,695	1,864,071	2,112,279
	2 mos.	2,241	13,985,355	950,198	15,552,502	2,369,778	3,177,513	226,720	4,403,111	517,606	10,705,953	68.8	4,846,549	3,245,784	3,648,654	4,476,936
Norfolk & Southern	Feb.	931	628,500	32,074	697,330	86,765	97,942	29,325	269,750	28,596	510,178	73.2	187,152	137,658	110,531	133,832
	2 mos.	931	1,238,991	77,613	1,400,064	173,619	208,398	55,607	542,660	59,280	1,031,646	73.7	368,418	270,057	221,264	247,755
Northern Pacific	Feb.	6,708	5,409,863	754,757	6,698,492	698,919	1,434,361	212,792	2,495,089	252,020	5,169,993	77.2	1,528,499	858,706	1,217,649	694,009
	2 mos.	6,708	10,360,568	1,675,437	13,156,114	1,402,213	2,904,328	450,758	5,225,161	511,915	10,652,316	81.0	2,503,798	1,166,326	1,903,184	1,037,564
Northwestern Pacific	Feb.	477	238,002	117,733	397,310	89,626	75,294	7,898	213,359	25,006	411,084	103.5	—13,774	—54,415	—58,279	—78,880
	2 mos.	477	458,450	232,624	774,654	186,147	156,758	16,397	443,428	46,465	849,033	109.6	—74,379	—155,720	—164,682	—127,833
Pennsylvania R. R.	Feb.	10,513	33,144,589	9,992,648	47,300,947	5,655,518	10,391,916	779,153	18,155,169	1,557,045	37,181,828	78.6	10,119,119	8,159,508	6,871,460	6,643,421
	2 mos.	10,513	65,306,396	21,681,012	95,389,731	11,435,037	21,189,417	1,604,210	37,200,640	3,131,206	75,888,324	79.6	19,501,407	15,490,644	13,121,107	11,276,557
Baltimore, Chesapeake & Atlantic	Feb.	130	57,023	13,308	75,380	12,597	25,740	1,978	66,463	2,684	109,462	145.2	—34,082	—34,085	—34,152	—41,708
	2 mos.	130	105,421	30,677	147,276	21,004	40,502	3,259	137,698	5,728	208,191	141.4	—60,915	—60,921	—62,164	—74,699
Long Island	Feb.	403	756,297	1,746,223	2,669,965	396,615	463,793	26,394	1,314,281	72,392	2,278,031	85.3	391,934	326,933	115,225	54,049
	2 mos.	403	1,583,310	3,655,929	5,589,575	788,885	1,179,867	46,305	2,640,344	162,504	4,826,552	86.3	763,023	637,907	291,326	208,880
West Jersey & Seashore	Feb.	370	346,385	329,644	710,157	129,077	129,458	13,334	383,891	23,650	679,779	95.7	30,378	29,043	4,328	—15,206
	2 mos.	370	678,090	639,350	1,382,870	248,681	253,548	27,379	793,817	48,780	1,372,853	99.3	10,017	9,669	—41,438	—47,677
Peoria & Pekin Union	Feb.	19	22,112	1,707	167,556	11,274	12,648	3,150	69,668	7,358	104,098	62.1	63,458	46,458	67,098	57,565
	2 mos.	19	42,195	4,000	330,509	21,568	23,304	5,801	146,100	15,501	212,274	64.2	118,235	84,235	130,133	93,507
Pere Marquette	Feb.	2,244	2,791,532	207,274	3,170,815	235,529	707,420	61,480	1,169,370	108,014	2,285,149	72.1	885,666	691,141	707,072	777,652
	2 mos.	2,244	5,270,493	463,870	6,072,329	474,185	1,439,317	123,387	2,343,203	231,126	4,624,343	76.2	1,447,986	1,053,352	952,821	1,117,925
Pittsburgh & Shawmut	Feb.	102	151,382	5,852	158,666	18,749	33,401	1,771	45,186	6,163	105,270	66.3	53,396	52,205	43,298	24,750
	2 mos.	102	343,032	11,845	357,863	35,311	72,506	3,784	98,811	12,938	223,350	62.4	134,513	132,143	114,423	57,292
Pittsburgh & West Virginia	Feb.	92	297,402	5,695	334,784	18,227	61,483	15,618	66,841	16,922	188,242	56.2	146,542	101,009	157,235	264,951
	2 mos.	92	575,554	11,883	651,035	38,539	130,752	27,347	132,622	38,155	386,654	59.4	264,381	175,301	295,223	507,843
Pittsburgh, Shawmut & Northern	Feb.	198	148,017	2,250	152,536	22,886	30,289	1,513	49,996	5,476	110,160	72.2	42,376	39,361	34,328	22,461
	2 mos.	198	296,988	4,642	306,260	53,472	61,771	3,082	103,808	11,153	233,286	76.2	72,974	66,968	54,945	40,410
Quincy, Omaha & Kansas City	Feb.	249	42,873	11,680	59,340	18,460	7,539	731	28,656	2,401	57,444	96.8	1,896	—2,930	—5,496	—5,695
	2 mos.	249	87,387	23,295	121,460	36,796	18,177	1,477	58,767	5,253	120,024	98.8	1,436	—8,217	—13,274	—39,234
Reading	Feb.	1,136	5,968,232	678,651	6,960,264	871,883	1,736,287	87,698	2,779,529	206,368	5,692,422	81.8	1,267,842	945,094	1,023,640	1,162,641
	2 mos.	1,136	11,843,521	1,421,243	13,898,093	1,713,896	3,633,016	172,091	5,587,959	409,131	11,539,048	83.0	2,359,045	1,676,453	1,846,624	2,514,799
Atlantic City	Feb.	161	106,705	80,919	201,374	69,784	31,826	4,727	195,568	5,148	307,397	152.6	—106,023	—143,373	—158,095	—125,935
	2 mos.	161	219,898	166,116	414,121	156,663	60,715	15,006	402,281	11,422	649,112	156.7	—234,991	—309,691	—352,673	—313,009
Perkiomen	Feb.	41	95,668	2,721	101,758	13,543	6,018	107	48,526	1,242	69,484	68.3	32,274	31,767	25,724	27,426
	2 mos.	41	186,550	5,738	198,757	22,552	11,413	213	95,999	2,533	132,816	66.8	65,941	57,987	45,334	56,935
Port Reading	Feb.	19	157,586	.....	202,676	22,104	6,276	229	72,121	1,419	102,147	50.4	100,529	80,189	12,726	—26,173
	2 mos.	19	310,499	.....	399,741	39,288	12,610	458	145,200	7,397	204,951	51.3	194,790	159,438	26,316	—28,617
Richmond, Fredericksburg & Potomac	Feb.	117	382,422	383,209	936,285	77,652	169,934	8,485	327,815	34,967	651,395	69.6	284,890	230,198	179,419	103,723
	2 mos.	117	754,777	789,826	1,872,089	173,239	343,975	19,247	676,348	73,177	1,346,124	71.9	525,965	422,769	297,552	247,055
Rutland	Feb.	413	281,865	117,424	517,822	99,779	102,027	8,543	216,187	14,011	442,068	85.4	75,754	49,970	56,064	38,368
	2 mos.	413	560,593	237,322	1,055,904	195,693	207,238	22,199	442,056	27,404	898,146	85.1	157,758	107,494	108,084	79,846
St. Louis-San Francisco	Feb.	5,074	4,740,953	892,601	6,067,726	651,750	1,291,570	114,097	2,155,155	236,114	4,380,113	72.19	1,687,613	1,353,588	1,392,751	1,747,972
	2 mos.	5,058	9,722,765	1,903,048	12,486,860	1,442,690	2,629,641	231,442	4,433,631	474,210	9,086,582	72.77	3,400,278	2,727,743	2,797,565	3,372,591
Ft. Worth & Rio Grande	Feb.	233	69,354	11,260	91,823	15,966	21,110	3,431	48,240	5,510	94,236	102.6	—2,413	—6,501	—15,617	—12,037
	2 mos.	233	150,152	24,797	197,712	30,678	42,225	6,764	100,940	10,941	191,502	96.9	6,210	—2,013	—20,144	—23,451
St. Louis, San Francisco & Texas	Feb.	137	129,092	10,846	144,431	19,103	23,145	4,495	60,388	6,637	113,768	78.8	30,663	28,008	4,374	9,402
	2 mos.	137	249,948	22,750	281,546	34,453	48,366	9,287	113,942	13,710	219,696	78.0	61,850	56,530	10,652	28,776
St. Louis Southwestern	Feb.	940	1,297,499	77,862	1,435,908	149,781	213,654	71,081	379,727	63,327	881,362	61.4	554,546	481,540	369,217	281,226
	2 mos.	940	2,612,129	173,465	2,914,327	303,974	427,168	136,782	791,082	127,294	1,798,240	61.7	1,116,087	973,661	759,664	627,186
St. Louis Southwestern of Texas	Feb.	807	447,019	39,328	537,882	125,046	108,548	30,705	243,068	34,385	547,571	101.8	—9,689	—37,569	473	—57,845
	2 mos.	807	948,444	87,697	1,132,132	317,400	228,840	60,358	503,689	67,740	1,187,065	104.9	—54,933	—110,564	—36,238	—39,111
San Diego & Arizona	Feb.	156	83,655	26,436	113,525	18,501	16,157	4,154	31,639	9,394	81,165	71.5	32,360	26,693	25,928	15,171
	2 mos.	156	154,818	52,462	215,194	36,249	33,074	8,701	63,389	18,296	162,407	75.5	52,787	41,456	41,578	56,894
Seaboard Air Line	Feb.	4,499	3,580,102	1,036,732	5,078,524	522,770	772,916	198,597	1,931,454	190,784	3,728,321	73.4	1,350,203	1,032,842	934,219	920,711
	2 mos.	4,499	7,223,627	2,120,515	10,262,005	1,183,393	1,652,398	414,830	3,940,000	385,184	7,786,276	75.9	2,475,729	1,833,118	1,603,277	1,740,338
Southern Ry.	Feb.	6,772	8,585,994	1,830,413	11,258,471	1,679,898	2,059,815	248,924	3,859,077	338,445	8,254,037	73.3	3,004,434	2,262,910	2,029,835	2,187,001
	2 mos.	6,772	16,734,486	3,991,735	22,417,055	3,371,423	4,196,281	489,804	7,882,954	678,929	16,773,311	74.8	5,643,744	4,156,809	3,690,086	3,957,619

Revenues and Expenses of Railways

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income. 1927.
Alabama Great Southern	Feb.	314	$581,356	$130,777	$762,213	$128,240	$168,670	$21,011	$258,574	$22,986	$606,615	79.6	$155,598	$112,302	$131,980	$147,914
	2 mos.	314	1,142,528	280,392	1,522,589	262,487	320,983	43,209	517,918	46,065	1,204,904	79.1	317,685	221,726	267,436	307,817
Cinn., New Orleans & Texas Pacific	Feb.	338	1,296,542	288,369	1,676,837	290,847	345,271	40,166	483,037	51,362	1,226,457	73.1	450,380	363,486	336,610	295,690
	2 mos.	338	2,523,595	627,415	3,330,370	550,124	696,758	81,380	995,586	107,272	2,464,363	74.0	866,007	684,428	636,961	535,358
Georgia Southern & Florida	Feb.	401	204,104	137,782	376,083	69,412	73,936	11,287	161,713	11,323	336,090	89.4	39,993	17,732	14,271	—11,764
	2 mos.	401	417,890	291,545	775,098	150,970	156,210	21,234	322,175	22,427	689,927	89.0	85,171	41,670	40,050	—3,826
New Orleans & Northeastern	Feb.	204	338,780	72,678	439,066	60,685	75,305	12,644	127,875	14,273	295,111	67.2	143,955	104,147	73,119	101,818
	2 mos.	204	674,719	145,266	876,377	128,832	151,977	25,111	269,685	29,110	613,301	70.0	263,076	174,891	117,594	161,856
Northern Alabama	Feb.	110	79,783	6,178	88,379	27,296	1,230	1,928	30,285	2,772	63,503	71.9	24,876	18,476	—2,875	9,869
	2 mos.	110	155,599	13,301	173,548	53,096	5,951	3,731	63,371	5,522	131,560	75.8	41,988	29,133	—15,924	26,153
Southern Pacific	Feb.	8,909	11,210,657	2,991,004	15,567,280	1,961,090	2,759,841	408,639	5,216,321	703,778	11,320,363	72.7	4,246,917	2,831,543	2,728,114	1,988,399
	2 mos.	8,915	21,953,607	6,108,477	30,847,339	4,075,310	5,667,178	846,124	10,719,881	1,369,413	23,228,816	75.3	7,618,523	4,939,551	4,625,922	3,882,003
So. Pacific Steamship Lines	Feb.	....	744,652	54,733	912,937	18,899	194,883	20,241	629,010	34,299	897,332	98.3	15,605	12,761	12,104	155,252
	2 mos.	....	1,443,034	83,499	1,791,427	33,955	354,520	39,445	1,195,366	72,807	1,696,093	94.7	95,334	90,629	89,745	223,303
Texas & New Orleans	Feb.	4,602	3,898,115	900,286	5,191,508	848,494	1,033,059	183,349	1,986,002	262,204	4,328,161	83.4	863,347	577,487	332,597	90,631
	2 mos.	4,602	7,803,731	1,818,885	10,431,273	1,904,049	2,227,943	358,564	4,074,477	523,606	9,107,699	87.3	1,323,574	753,094	266,367	213,509
Spokane, Portland & Seattle	Feb.	554	507,467	76,864	635,177	87,120	103,976	10,053	196,648	21,701	423,630	66.7	211,547	127,810	121,950	95,116
	2 mos.	554	940,229	172,675	1,227,491	154,311	203,120	20,813	410,646	43,721	838,056	68.3	389,435	221,960	210,599	183,834
Tennessee Central	Feb.	296	228,541	17,743	259,310	46,631	43,793	9,408	96,120	12,874	208,813	80.5	50,497	44,437	27,176	11,904
	2 mos.	296	449,479	38,410	513,653	93,123	88,411	18,517	197,071	25,176	422,144	82.2	91,509	80,107	43,747	—12,044
Terminal R. R. Assn. of St. L.	Feb.	55	.....	.....	1,069,439	134,984	93,520	2,256	457,629	26,980	711,197	66.5	358,242	259,354	342,756	353,592
	2 mos.	55	.....	.....	2,181,013	272,109	189,672	4,838	926 821	53,396	1,446,043	66.3	734,970	536,680	706,731	747,137
Texas Mexican	Feb.	162	74,219	4,981	86,806	12,482	13,856	3,404	25,270	5,879	60,654	69.9	26,152	21,028	16,520	—3,771
	2 mos.	162	129,936	9,211	152,165	28,689	31,100	7,136	62,465	12,210	141,363	92.9	10,802	669	—9,367	—15,247
Toledo, Peoria & Western	Feb.	239	162,592	3,113	173,065	54,067	17,309	11,039	57,698	7,778	147,891	85.5	25,174	20,174	11,241	2,730
	2 mos.	239	286,387	6,964	307,431	81,014	33,523	21,150	113,495	16,042	265,224	86.3	42,207	35,157	14,626	—6,444
Toledo Terminal	Feb.	28	.....	.....	100,905	6,545	15,961	476	42,890	4,672	70,544	69.9	30,361	12,861	39,751	78,863
	2 mos.	28	.....	.....	209,009	7,815	30,089	976	89,236	9,486	137,602	65.8	71,407	36,411	96,337	129,598
Trinity & Brazos Valley	Feb.	367	188,353	8,160	203,226	55,200	35,491	5,130	87,073	11,450	185,036	91.0	18,190	10,725	—14,820	—3,888
	2 mos.	367	408,294	16,183	438,121	106,227	70,430	10,745	187,444	23,044	382,922	87.4	55,199	40,104	—16,237	—25,975
Ulster & Delaware	Feb.	128	22,519	2,818	54,801	11,295	15,138	1,206	35,463	4,919	68,021	124.1	—13,220	—18,970	—20,091	—21,852
	2 mos.	128	43,244	6,674	107,714	23,853	30,151	2,568	72,573	9,868	139,013	129.1	—31,299	—42,799	—44,907	—47,528
Union Railroad of Penna.	Feb.	45	.....	.....	667,521	51,974	164,241	157	363,954	12,629	592.955	88.8	74,566	56,066	133,988	162,487
	2 mos.	45	.....	.....	1,330,205	115,337	333,534	323	731,005	26,304	1,206 503	90.7	123,702	93,702	251,301	248,872
Union Pacific	Feb.	3,711	6,399,314	965,021	7,987,222	569,681	1,760,418	152,627	2,266,830	327,327	5,201,964	65.1	2,785,258	2,118,946	1,924,991	1,439,553
	2 mos.	3,711	12,809,179	2,096,978	16,168,842	1,219,049	3,613,121	310,473	4,717,988	665,153	10,786,301	66.7	5,382,541	4,050,344	3,669,336	2,760,349
Oregon Short Line	Feb.	2,539	2,341,279	272,653	2,785,534	369,815	490,078	47,970	808,840	125,552	1,887,731	67.8	897,803	634,302	585,066	509,661
	2 mos.	2,539	4,662,510	591,437	5,621,683	677,745	1,042,473	101,442	1,685,626	254,913	3,868,920	68.8	1,752,763	1,227,776	1,104,719	922,574
Oregon-Wash. R. R. & Nav. Co.	Feb.	2,343	1,685,095	240,406	2,118,908	407,558	377,441	69,993	824.157	126,106	1,835,585	86.6	283,323	95,208	—39,314	102,337
	2 mos.	2,343	3,233,570	530,500	4,178,721	743,306	794,654	143,979	1,733,320	255,968	3,742,835	89.6	435,886	52,368	—211,360	22,284
Los Angeles & Salt Lake	Feb.	1,209	1,327,891	274,935	1,767,501	324,056	378,284	71,181	609,328	77,030	1,539,931	87.1	227,570	91,652	—814	—109,331
	2 mos.	1,209	2,745,995	597,139	3,681,841	634.628	784,680	141.477	1,288,390	158,223	3,174,351	86.2	507,490	236,415	43,007	4,008
St. Joseph & Grand Island	Feb.	258	291,683	12,245	319,131	28,477	34,633	3,128	103,114	15,368	184,725	57.9	134,406	108,206	92,385	44,272
	2 mos.	258	564,420	25,015	621,080	61,459	72,999	6,407	212.073	31,801	384,739	61.9	236,341	187,825	157,286	76,704
Utah	Feb.	111	141,552	.....	141.791	17,212	39 642	392	30.224	5,354	92,824	65.5	48,967	42,426	34,946	34,041
	2 mos.	111	364,602	.....	365,554	61,584	84,550	779	78,887	11,884	237,684	65.0	127,870	107,287	82,753	108,026
Virginian	Feb.	545	1,479,748	40,363	1,618,365	172,318	368,613	13,365	336,109	36,554	926,453	57.2	691,912	531,912	582,138	844,062
	2 mos.	545	3,046,607	82,564	3,319,432	333,325	697,170	29,107	693,998	73,079	1,824,814	55.0	1,494,618	1,174,611	1,269,922	1,884,527
Wabash	Feb.	2,524	4,433,361	527,747	5,310.314	552,081	960.983	164,469	2,153,777	177,791	4,029,840	75.9	1,280,474	1,013,703	703,770	697,345
	2 mos.	2,524	8,679,674	1,154,491	10,541,421	1,118,834	1,937,811	326,267	4,353,831	358.681	8,137,784	77.2	2,403,637	1,883,176	1,274,837	1,242,066
Ann Arbor	Feb.	293	443,841	16,657	472,197	38,362	90,098	13,785	191,386	10,428	344,044	72.9	128,153	105,016	77,184	84,366
	2 mos.	293	828,201	37,002	890,266	80.392	179,674	26.265	379.651	22,759	688,769	77.4	201,497	154,947	107,106	99,493
Western Maryland	Feb.	804	1,470,389	30,289	1,542,019	221,125	301,054	41,192	466,304	43,089	1,076,530	69.8	465,489	380,489	409,815	465,267
	2 mos.	804	2,970.664	65,443	3,121,911	413,661	636,846	80,392	947,719	90,682	2,175,133	69.7	946,778	776,778	847,534	947,542
Western Pacific	Feb.	1,050	872,741	86,179	1,013,971	192,465	234,342	49,159	412,356	45,061	929,300	91.6	84,671	—12,999	47,636	21,329
	2 mos.	1,050	1,818,121	156,238	2,089,861	427.042	462.436	96,647	854,563	90,569	1,946,274	93.1	143,587	—51,872	80,904	144,523
Wheeling & Lake Erie	Feb.	511	1,305,545	23,181	1,409,776	133,889	361,860	32,578	421,783	41,516	993,075	70.4	416,101	289,495	290,629	314,664
	2 mos.	511	2,429,320	50,368	2,634,305	265,101	674,840	65,017	851,161	87.398	1,946,512	73.9	687,793	449,572	452,583	540,671
Wichita Falls & Southern	Feb.	169	74,067	2,389	80,973	15,570	12.393	2,712	30,212	4,059	64,946	80.21	16,027	11,054	9,306	17,613
	2 mos.	169	135,587	4,799	149,287	31,621	22,396	5,154	53,249	8,330	120,750	80.88	28,537	18,240	13,882	65,942

News of the Week

(*Continued from page 881*)

Railway Fuel Convention

The formal program of the twentieth annual convention of the International Railway Fuel Association has just been released and from all present indications the three-day meeting, to be held May 8 to 11 inclusive at the Hotel Sherman, Chicago, will be even more successful than usual. An examination of the list of individual papers and committee reports to be presented shows a well-balanced and instructive program which will be broad in its appeal and offer much of interest and inspiration to railway purchasing, operating and mechanical officers, as well as to representatives of the coal industry. The division of the program into definite sessions, as shown in the following detailed schedule, will be helpful in enabling members and guests to attend the sessions in which they are most interested.

TUESDAY, MAY 8, 1928

General Session
Meeting to convene at 11 a.m.
Invocation
Address by President J. E. Davenport, division superintendent, New York Central
Address by T. W. Evans, vice-president, Indiana Harbor Belt
Address by Samuel Wyer, consulting mining engineer

Technical Session
Call to order at 2:30 p.m.
Report of Committee on Steam Turbine Locomotives
Report of Committee on Stationary Power Plants
Report of Committee on Diesel Locomotives

WEDNESDAY, MAY 9, 1928

Operating Session
Call to order at 9:30 a.m.
Address by Col. F. W. Green, vice-president, St. Louis Southwestern
"Influence of Commodities on Fuel," paper by Dr. J. H. Parmalee, director, Bureau of Railway Economics, American Railway Association
Report of Committee on Fuel Bulletins
"Roller Bearings in Relation to Fuel Economy," paper by K. F. Nystrom, superintendent car department, Chicago, Milwaukee, St. Paul & Pacific

Firing Practice Session
Call to order at 2 p.m.
Report of Committee on Locomotive Firing Practice and discussion

THURSDAY, MAY 10, 1928

Mechanical Session
Call to order at 9:30 a.m.
Address by W. L. Bean, mechanical manager, New York, New Haven & Hartford
"The Possibilities of Future Locomotive Design," paper by W. E. Woodard, vice-president, Lima Locomotive Works.
"The Locomotive of Today and the Future as a Factor in Fuel Economy," paper by A. W. Bruce, designing engineer, American Locomotive Company.
"Combustion in Locomotive Boilers," paper by Lawford Fry, metallurgical engineer, Standard Steel Works Company.

Mechanical Session
Call to order at 2 p.m.
Address by A. G. Pack, chief inspector, Bureau of Locomotive Inspection, Interstate Commerce Commission
Report of Committee on New Locomotive Economy Devices
Report of Committee on Front Ends, Grates and Ash Pans

FRIDAY, MAY 11, 1928

Fuel Supply Session
Call to order at 9:30 a.m.
Address by E. L. Mahan, president, National Coal Association
Report of Commitee on Fuel Stations
Report of Committee on Accounting, Distribution and Statistics
Report of Committee on Inspection, Preparation and Analysis of Fuel

Business Session
Call to order at close of Fuel Supply Session, or at 2 p.m.
Report of Committee on Constitution and By-Laws
Election of Officers
Report of Secretary-Treasurer
Report of Auditing Committee
Adjournment

Traffic

The Northern Pacific, the Great Northern and the Spokane, Portland & Seattle have opened a consolidated ticket office in the American Bank Building at Portland, Ore.

Representative Perry, of Virginia, has introduced in Congress a bill, H. R. 12,692, to amend the interstate commerce act to provide that the Interstate Commerce Commission shall not have power to increase a railroad rate "which will yield something more than the out-of-pocket cost of the service performed," nor to prevent a reduction in a rate if on hearing it is proved that the proposed rate will yield more than the out-of-pocket cost. It is provided, however, that this shall not be construed to take away the commission's power to prevent undue preference or prejudice, under section 3, but that a higher rate shall not be deemed discriminatory as against a lower rate if the higher rate exceeds the lower by more than 10 per cent.

Through Trains for Longview, Ore.

The Interstate Commerce Commission has authorized the operation of Northern Pacific, Great Northern and Oregon-Washington pooled passenger service over the line of the Longview, Portland & Northern between Longview Jct., Ore., and Olequa, a distance of 21 miles.

The first three roads operate a pooled passenger service between Seattle and Portland, 5 trains in each direction daily. Between Olequa and Longview Jct. these trains now operate over the Northern Pacific, which is paralleled by the Longview, Portland & Northern. The diversion of two of these pooled through trains each direction daily over the tracks of the Longview, Portland & Northern will give through service to Longview, a community of 12,500 people who must now cross the Cowlitz river and utilize the Kelso station. Having no station on a main-line railroad is considered detrimental to the advancement of Longview and the proposed change will correct this.

The railroads operating the joint service will make no payment to the Longview, Portland & Northern other than its proportion of the expense of operating the station at Longview and interest on the investment in this station.

N. I. T. League

The National Industrial Traffic League will hold its annual meeting on November 22 and 23 at the Hotel Astor, New York. The spring meeting this year will be omitted unless matters of sufficient importance arise to require the action of the entire membership.

Equipment and Supplies

Freight Cars

THE FRUIT GROWERS EXPRESS has ordered 600 steel underframes from the American Car & Foundry Company. These underframes will be used in refrigerator cars to be built in the Fruit Growers Express Company Shops. Inquiry for 1200 underframes was reported in the *Railway Age* of March 3.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has ordered 4,450 freight cars as follows: 1250 box cars from the Bettendorf Company; 500 box cars from the General American Car Company; 500 box cars from the Pressed Steel Car Company; 250 box from the Pacific Car & Foundry Co.; 300 automobile cars from the American Car & Foundry Co.; 500 hopper cars from the Pullman Car & Manufacturing Corporation and 500 hopper cars from the Standard Steel Car Company; 500 stock cars from Ryan Car Company and 150 stock cars from the Siems-Stemble Company. Inquiry for this equipment was reported in the *Railway Age* of February 25.

THE WESTERN MARYLAND has placed orders for miscellaneous shapes and plates, fabricated, for reconditioning some of its hopper cars; the orders placed are estimated to take care of such miscellaneous repairs for approximately 500 cars.

THE NORTHERN PACIFIC has ordered 50 caboose car underframes from the Pacific Car & Foundry Company.

THE STANDARD OIL COMPANY OF NEW JERSEY has ordered 6 steel box cars of 50 tons' capacity from the Pressed Steel Car Company. Inquiry for 12 box cars was reported in the *Railway Age* of January 21.

Passenger Cars

THE BALTIMORE & OHIO is inquiring for 10 combination baggage and mail cars.

THE RICHMOND, FREDERICKSBURG & POTOMAC has ordered 1 cafe car from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of March 31.

THE UNION PACIFIC has ordered from the J. G. Brill Company two 73-ft. gas-electric rail motor cars and an order for converting two McKeen cars to gas-electric.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 3 gas-electric units for rail motor cars from the Mack-International Motor Company, the bodies to be built by the Cummings Car and Coach Company, Chicago, and eight units from the Electro-Motive Company, the bodies to be built by the St. Louis Car Company. Inquiry for this equipment was reported in the *Railway Age* of February 18.

Iron and Steel

THE MAINE CENTRAL is inquiring for 200 tons of steel for five bridges.

THE TEXAS & PACIFIC has just announced that it will enter the market for 12,000 tons of steel rail.

THE LOUISVILLE & NASHVILLE has ordered 220 tons of structural steel for bridge work from the Ingalls Iron Works Company.

THE PENNSYLVANIA is inquiring for 400 tons of steel for a bridge in Ohio. An order for 150 tons of steel for a bridge near Philadelphia, Pa., has been given to the American Bridge Company.

THE CHICAGO & NORTH WESTERN has divided an order for 6,000 tons of structural steel for miscellaneous bridge work between the Clinton, Iowa, Bridge Works and the American Bridge Company.

THE CHICAGO, BURLINGTON & QUINCY has divided orders for 13,800 tons of rails among the Illinois Steel Company, the Inland Steel Company and the Colorado Fuel & Iron Company.

THE SOUTHERN is inquiring for 700 tons of structural steel for miscellaneous bridge work, of which 500 tons is for a viaduct at Clouds, Tenn., and 200 tons for various bridges on its western lines.

Machinery and Tools

THE UNION PACIFIC is inquiring for one 32-in. shaper.

THE DULUTH, MISSABE & NORTHERN is inquiring for two lathes, one flue welder and one bolt forger.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered a vertical drill press from the Niles-Bement-Pond Company.

THE GREAT NORTHERN is inquiring for 1 traveling crane.

Signaling

THE CANADIAN PACIFIC has ordered from the Union Switch & Signal Company material for the installation of automatic block signals on its line between Indian Head, Sask., and Grenfell, 37 miles, and between Beavermouth, B. C., and Golden, 28 miles. The order includes 115 top-post signals, 300 relays, 55 switch indicators and other material. Low voltage switch movements are to be installed at the ends of double track.

Supply Trade

L. Weisenburger, sales representative at Chicago of the **Hale-Kilburn Company,** has resigned, effective April 30.

Wm. McCormick has resigned as Pittsburgh sales manager of the Niles Tool Works Company, and the Pratt & Whitney Co., and is now western sales representative of **Leeds, Tozzer & Co., Inc.,** New York.

The Wright Manufacturing Company, Lisbon, Ohio, manufacturers of chain hoists, trolleys and cranes, has sold its business and trade name to the **American Chain Company, Inc.,** Bridgeport, Conn. There is no anticipated change in policies or sales organization of Wright Manufacturing Company. **H. F. Wright** and **W. F. Wright** will continue in their respective divisions of sales and production of Wright products.

The Graham Bolt & Nut Company, Pittsburgh, Pa., has opened a district office at 1 East Forty-second street, New York City, under the direction of **W. K. Graham.** Sales in the New England states as well as the Metropolitan district will be directed by this office.

J. I. McCants, formerly general sales manager of the Signal Mountain Portland Cement Company, Chattanooga, Tenn., has been appointed southern sales manager of the **Bates Valve Bag Corporation,** Chicago, with headquarters at Birmingham, Ala., where the company has established a branch factory.

H. W. Dillon, formerly sales engineer of the Chicago Pneumatic Tool Company, is now sales engineer with the **Gold Car Heating & Lighting Company,** with headquarters at Brooklyn, N. Y. **J. P. Rapp,** formerly with the Standard Steel Car Company and who had served as inspector of the American International Shipbuilding Corporation, is now with the **Gold Car Heating & Lighting Company** in its eastern sales department, Brooklyn.

R. F. DeMott has been appointed district manager of the **Franklin Railway Supply Company, Inc.,** with headquarters at St. Paul, Minn., effective February 15. Mr. DeMott entered railway service as a machinist helper, in 1903, with the Atchison, Topeka & Santa Fe. He was later promoted to engineman and then went in the same capacity with the Colorado & Wyoming. Mr. DeMott entered the service department of the Franklin Railway Supply Company, Inc., in November, 1918, since which time he has been assigned to the western territory.

Obituary

George E. Titcomb, vice-president of the McMyler-Interstate Co., Bedford, Ohio, died on April 1.

John Sommers, vice-president and a founder of the Keystone Steel & Wire Company, Peoria, Ill., died on April 7 from apoplexy.

William Stuart Auchincloss, formerly engaged in the manufacture of railroad cars, died on April 10 at his home at Atlantic Highlands, N. J., at the age of 86. After his graduation from Rensselaer Polytechnic Institute in 1862, he served for six years in the construction department of the Atlantic & Great Western, now a part of the Erie, and with the Jersey City Locomotive Works. From 1871 to 1879 he was engaged in the manufacture of railroad cars. Mr. Auchincloss was an inventor and wrote several books, including one on Link and Valve Motions.

Matt Brodie, manager for Asia for the **Sullivan Machinery Company,** Chicago, with headquarters at Tokio, Japan, died on March 25, from pneumonia following an operation for appendicitis. He entered the employ of the Sullivan Machinery Company immediately after graduating from the Massachusetts Institute of Technology in 1902. After becoming manager of the Salt Lake City, Utah, office of the company he was assigned to foreign duty and for eight years was in Australia, where he organized and conducted the Sydney branch office of the company. In 1916 he was sent to Russia, in direct charge of the company's interests there. After the Russian revolution he returned to the United States and was shortly sent to Japan where he has been manager of the company's Asiatic business in Japan, China and India for the last 10 years.

Harry Fulton, assistant comptroller of the American Locomotive Company, at New York, died at his home in New York on April 7. Mr. Fulton entered the accounting department of the Pittsburgh Locomotive & Car Works of Pittsburgh, Pa., in March, 1895. He was promoted to various positions in the department and continued with the company after it was absorbed in the organization of the American Locomotive Company in June, 1901. In April, 1905, he was appointed shop accountant in charge of the Pittsburgh plant accounting department. In October, 1907, he was promoted to a position in the general offices of the American Locomotive Company in New York, being appointed general shop accountant in June, 1911. In December, 1917, he was appointed assistant comptroller of the company, which position he held until his death.

Trade Publications

FEDERAL INTERLOCKING TILE.—The Federal Cement Tile Company, Chicago, has issued a four-page folder describing its precast concrete interlocking roofing tile, which is made either plain or with a pane of wire glass embedded in the concrete. The booklet gives data as to the installation of these tiles, supplemented by line drawings, and also contains views of buildings with roofs of this material.

Construction

BANGOR & AROOSTOOK.—This road plans to raise the bridge over the St. John river at Van Buren, Me., and to raise the tracks to take care of high water, caused by the dam in process of construction at Grand Falls, Me., on the St. John river, at Van Buren and north along the St. John river at a cost of $58,000. This work will be done by company forces.

BOSTON & MAINE.—A contract for the construction of a four-track reinforced concrete automatic electric coaling station of 500 tons capacity at East Deerfield, Mass., has been awarded to the Roberts and Schaefer Company, Chicago.

CANADIAN PACIFIC.—A contract for the construction of a 100-ton coaling station at Elkhorn, Man., has been let to Macaw and Macdonald, Winnipeg, Man.

CHICAGO, SPRINGFIELD & ST. LOUIS.—Contingent upon the approval of the merger of this company and the Jacksonville & Havana by the Illinois Commerce Commission and the Interstate Commerce Commission it is planned to expend about $1,108,000 for improvements to the roadway, buildings and terminal facilities of these two railroads, according to an announcement by J. W. Muessen, general manager. Replacement of bridges, surfacing of track and additional ballast on the 128 miles of line will require an expenditure of $237,500; new equipment and coaling stations will cost about $211,700; and the construction of new buildings, fences and similar facilities will require an expenditure of about $658,000. Included in the plans for buildings are the construction of a freight and passenger terminal at Springfield, Ill., and a general shop at either Springfield, Jacksonville, Ill., or Jerseyville.

GREAT NORTHERN.—A contract for the construction of a branch line from Saco, Mont., to Turner, about 80 miles, has been awarded to A. Guthrie & Co., St. Paul, Minn. This extension, which, it is estimated, will involve a total expenditure of $2,000,000, will furnish transportation to a wheat producing area near the Canadian border.

NEW YORK CENTRAL.—This road has let a contract to David Kramer, Inc., New York, for moving the Consolidated Ticket Offices from 64 Broadway to 17 John street, New York. Babor-Comeau & Co., Inc., New York, have been awarded a contract for the construction of a poultry terminal building and platform at Port Morris, N. Y. A contract has been awarded to the Union Iron Works, Inc., New York, for boilers for burning pulverized coal at Harmon, N. Y. A contract has also been let to the Walsh Construction Company, Syracuse, N. Y., for the reconstruction of bridges 270 and 272 at Tarrytown and Tivoli, N. Y., respectively.

PENNSYLVANIA.—This road has let a contract to the Ready Coal & Construction Co., Chicago, for paving at the 47th street subway at Chicago, the work involved to cost $25,000. A contract has also been awarded to the Arundel Corporation, Baltimore, Md., for the construction of a new undergrade bridge at Lakewood avenue in Baltimore, at a cost of $125,000. Sinclair & Grigg of Philadelphia, Pa., have been awarded a contract for the construction of a new coal dumper pier on the Delaware river, about a mile south of the present Greenwich terminal yard at Philadelphia. This project will cost $600,000. The Cement Gun Construction Company, New York, has been let a contract for the construction of protection screens on bridges at South street, 49th, 62nd, 63rd, 65th, 71st and 72nd streets, Philadelphia, in connection with electrifications from Philadelphia to Wilmington and Philadelphia to West Chester. This road has also awarded a contract to the Ogle Construction Company, Chicago, for the construction of coal and ash handling facilities at the Little Creek terminal, Norfolk, Va.

UNION PACIFIC SYSTEM.—This railroad has appropriated $28,800,000 for maintenance of way and structures and $23,000,000 for improvements to existing property and additional construction in 1928, according to an announcement by C. R. Gray, president. Included among the projects in the latter classification is the proposed construction of 10 miles of second main track on the Oregon Short Line between King Hill, Idaho, and Ticeska at an estimated cost of $675,000, enlargement and lining of tunnels for double tracking on the Los Angeles & Salt Lake, requiring an estimated expenditure of $375,000, and the expenditure of $550,000 for the completion of a $2,500,000 program of improvements at the Grand Canyon and in the Southern Utah parks region. In addition it is planned to separate the grade with highways and lengthen passing tracks at a number of points on the system. A new passenger station wil lbe constructed at Marysville, Kan., on the Union Pacific, and at Gering, Neb., it is planned to construct a new passenger station and engine terminal in connection with the establishment of an operating headquarters at that point for the North Platte line.

WESTERN PACIFIC.—A program of improvement and maintenance has beeen authorized by this company for 1928 which involves an expenditure of about $4,369,420. Included in this program is the widening of the subgrade between Oakland, Cal., and Sacramento at a cost of $160,000, the replacing of nine bridges and trestles with concrete and steel structures at a cost of $180,000, the extension of existing passing tracks and the construction of additional passing tracks between Oroville, Cal., and Portola at a cost of $310,000 and the improvement of yard tracks, depot facilities, and industrial and team tracks at division terminals. The bridge replacement program will include the construction of six steel bridges in Nevada and three steel bridges in California.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of $49,754,117, equivalent after allowance for the 5 per cent dividends on the preferred stock, to $18.73 per share on the outstanding common stock. Net income in 1926 was $60,631,495, or $23.41 per share. Selected items from the income statement follow:

ATCHISON, TOPEKA & SANTA FE	1927	1926
RAILWAY OPERATING REVENUES	$255,617,825	$259,040,316
Maintenance of way.	$41,813,138	$34,656,075
Maintenance of equipment	50,838,496	47,423,683
Transportation	75,491,457	76,901,305
TOTAL OPERATING EXPENSES	$178,240,266	$168,759,308
NET REVENUE FROM OPERATIONS	$77,377,558	$90,281,008
Railway tax accruals.	19,865,473	20,986,148
Railway operating income	$57,467,004	$69,246,469
Equipment rents, net, Dr.	2,155,636	2,487,611
Joint facility rents, net, Dr.	708,264	679,977
NET RAILWAY OPERATING INCOME	$54,603,104	$66,078,881
Other income	6,444,856	6,186,796
GROSS INCOME	$61,047,961	$72,265,677
Rent for leased roads and other charges.	61,037	323,454
NET INCOME	$49,754,117	$60,631,495

ATLANTIC COAST LINE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of not exceeding $73,237,000 general unified mortgage 50-year, series A, 4½ per cent gold bonds in exchange for temporary general unified mortgage bonds and due bills now in its treasury. The company's application insofar as it related to a further $1,359,000 of general unified mortgage bonds has been dismissed, since these were nominally issued in definitive form before the effective date of section 20a of the Interstate Commerce Act.

CENTRAL OF GEORGIA.—*Annual Report.*—The annual report of this company is summarized on advertising pages adjacent hereto.

CHICAGO & NORTH WESTERN.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of an issue of $2,145,000 of 4½ per cent equipment trust certificates to be sold at the best price obtainable.

CHICAGO & NORTH WESTERN.—*New Director.*—John D. Caldwell has been elected a director of the Chicago & North Western, succeeding the late Marvin Hughitt—term one year. Other directors have been re-elected for a three-year term.

CHICAGO, SPRINGFIELD & ST. LOUIS.—*Proposed Consolidation.*—The board of

(*Continued on page 893*)

Annual Report

Central of Georgia Railway Company

Report of the Board of Directors

To the Stockholders of Central of Georgia Railway Company:

The Board of Directors submits the following report of the operations and affairs of Central of Georgia Railway Company for the year ended December 31, 1927:

Income

A summary of the income for the year ended December 31, 1927, as compared with the previous year is shown in Table 2.

Railway Operating Revenues

"Railway Operating Revenues" amounted to $27,641,309.93 this year, as compared with $31,825,369.29 last year, a decrease of $4,184,059.36, or 13.15 per cent. For details of "Railway Operating Revenues" see Table 2.

"Freight Revenue" decreased $2,320,656.98, or 10.06 per cent. Tons of revenue freight carried one mile were 1,747,455,418, a decrease of 402,189,241, or 18.71 per cent, compared with last year. The average rate per ton per mile was 1.19 cents, an increase of 0.12 cents, or 11.21 per cent, compared with the previous year.

"Passenger Revenue" decreased $1,484,574.42, or 25.13 per cent. The number of passengers carried one mile was 143,093,390, a decrease of 43,922,982, or 23.49 per cent, compared with last year. The average revenue per passenger per mile decreased 0.07 cents, or 2.22 per cent. The decrease in passenger revenue was due mainly to the decrease in through traffic destined to and from Florida points, and to increased motor competition.

"Mail Revenue" increased $27,965.32, or 5.57 per cent.

"Express Revenue" decreased $149,328.69, or 14.50 per cent.

Railway Operating Expenses

"Railway Operating Expenses" amounted to $20,945,626.48 this year, as compared with $23,772,538.10 last year, a decrease of $2,826,911.62, or 11.89 per cent. For detail of "Railway Operating Expenses" see Table 9.

The decrease of $909,404.71, or 20.23 per cent., in "Maintenance of Way and Structure Expenses" was due mainly to decreased expenditures for renewal of rail, bridges, trestles, and culverts, and to the reduction in charges for retirements and incidental expenses in connection with revision of grade and line, Birmingham District.

The decrease of $564,156.26 or 10.26 per cent, in "Maintenance of Equipment Expenses" was due mainly to decreased use of equipment and to increased efficiency of shop forces. Charges to "Maintenance of Equipment" for depreciation were $891,214.59, an increase of $29,991.38, or 3.48 per cent. The average miles per serviceable locomotive were 31,628, a decrease of 4,511 miles, or 12.48 per cent. The average age of locomotives was 19.4 years, as compared with 18.7 per previous year.

"Traffic Expenses" decreased $31,739.46, or 3.41 per cent.

The decrease of $1,437,084.33, or 12.33 per cent in "Transportation Expenses" was due mainly to decrease in the volume of business handled and to increased operating efficiency resulting partly from the revision of grade and line, Birmingham District.

The increase in expenses by reason of the decrease of $179,021.42, or 72.82 per cent, in "Transportation for Investment—Credit" was due to the decrease in transportation performed in connection with the revision of grade and line, Birmingham District, and the decreased additions and betterments program.

Railway Tax Accruals

"Railway Tax Accruals" amounted to $1,555,181.83, this year, as compared with $1,519,851.76 last year, an increase of $35,330.07, or 2.32 per cent.

There was an increase of $107,465.25 in State, county, and municipal taxes, due to increase in assessed values and increased rates. This increase was partly offset by a decrease of $72,135.18 in Federal income taxes, due to decreased taxable income. The taxes for the year were equal to 23.23 per cent of the "Net Revenue from Railway Operations," and exceeded the total dividends paid to stockholders by $355,181.83.

Equipment Rents—Net Credit

"Equipment Rents—Net Credit" amounted to $12,424.46 this year, as compared with a net debit of $394,785.58 last year, a saving in net rental paid for the use of equipment of $407,210.04, due mainly to decreased use of foreign and privately owned freight cars because of the decreased volume of business handled.

Joint Facility Rent—Net Debit

"Joint Facility Rent—Net Debit" was $89,763.87 this year, as compared with $175,601.68 last year, a decrease of $85,837.81, due mainly to a reduction in estimates of increased rental at Montgomery, Ala., included in accounts of the previous year.

Non-Operating Income

"Non-Operating Income" amounted to $861,217.70 this year, as compared with $1,435,276.44 last year, a decrease of $574,058.74.

"Dividend income" decreased $521,141.75, because of extra and deferred dividends received last year from Atlanta and West Point Railroad Company, The Western Railway of Alabama, Louisville and Wadley Railroad Company, Wrightsville and Tennille Railroad Company, and Atlantic Compress Company. Other items contributing to the decrease were "Interest on bank balances," $15,337.07; "Interest on advances to affiliated companies," $9,628.00: "Royalty on coal mined," $8,436.12; "Interest during construction on capital outlay," $65,621.13. These decreases were partly offset by increase in "Miscellaneous rent income," $5,361.70; "Interest on advances to Hospital Department," $10,067.28; "Rent on leased rail and fastenings," $31,309.79.

Deductions from Gross Income

"Deductions from Gross Income" amounted to $3,696,131.61 this year as compared with $3,713,175.16 last year, a decrease of $17,043.55 There was a decrease of $17,616.22 in "Rent for leased roads," due to reduction in rent for properties of Chattahoochee & Gulf Railroad Company, and to purchase of property formerly leased from Macon and Birmingham Railway. There was a decrease of $10,594.21 in interest on "Nonnegotiable debt to affiliated companies," due to repayments during the year. Other items of decrease were "Miscellaneous rents," $2,883.87; "Amortization of discount on funded debt," $8,292.08; Miscellaneous income charges, $1,463.12. These decreases were partly offset by an increase in "Interest on funded debt" of $21,536.00, due to the inclusion of interest for the entire year on Refunding and General Mortgage Bonds, Series "C", issued April 1, 1926, less interest on equipment trusts and Eatonton Branch Railroad Bonds retired; and an increase in "Interest on unfunded debt," of $2,421.26.

Funded Debt

There were retired and cancelled under the terms of the respective trust agreements, Central of Georgia Equipment Trust, Series "M," $59,000.00; Series "N," $66,000.00; Series "O," $194,000.00; Series "P," $94,000.00; Series "Q," $256,000.00; Series "1," $63,663.30; a total of $732,663.30.

Other Indebtedness

"Nonnegotiable Debt to Affiliated Companies" decreased $175,000.00, amount repaid to Ocean Steamship Company of Savannah during the year.

Securities Owned

There was acquired during the year 461 shares of capital stock of Albany Passenger Terminal Company at a cost of $46,100.00; 50 shares of capital stock of Central of Georgia Motor Transport Company at a cost of $5,000.00; and one share of capital stock of Sylvania Central Railway Company at a cost of $20.00.

"Advances to Affiliated Companies" decreased $765,082.94 during the year.

Additions and Betterments

There was expended during the year for "Additions and Betterments" (including improvements on lessor properties) $809,898.54. The following is a classified statement of these expenditures:

Road:		
Engineering	$	9,788.55
Land for transportation purposes		167,290.79
Grading	Cr.	*3,428.99*
Bridges, trestles and culverts		119,750.11
Ties		64,652.38
Rails		41,613.73
Other track material		179,394.33
Ballast		14,108.05
Track laying and surfacing		30,250.76
Right-of-way fences		372.98
Crossings and signs		251,342.44
Station and office buildings		62,544.21
Roadway buildings	Cr.	*286.65*

[Advertisement]

Water stations		3,741.53
Fuel stations	Cr.	*2,211.59*
Shops and enginehouses		66,803.56
Storage warehouses		3,443.13
Telegraph and telephone lines		18,086.59
Signals and interlockers		34,589.71
Power substation buildings		20.49
Power distribution systems		8,852.09
Power line poles and fixtures		782.15
Miscellaneous structures	Cr.	*6,810.63*
Paving		2,960.26
Roadway machines	Cr.	*728.86*
Assessments for public improvements		87,190.67
Shop machinery		16,315.71
Power plant machinery		3,423.54
Power substation apparatus		1,704.22
Total		$ 1,175,555.26
Equipment:		
Steam locomotives		$ 19,880.50
Freight train cars		11,277.99
Passenger train cars		59,360.66
Work equipment		5,171.41
Miscellaneous equipment		4,255.54
Total		$ 99,946.10
Less equipment retired	Cr.	*465,602.82*
Net	Cr.	*$365,656.72*
Grand Total		$ 809,898.54

General Remarks

With deep sorrow, the Directors announce the death on January 2, 1928, of Charles M. Kittle. Mr. Kittle had served as a director since March 22, 1924. The Board has appropriately recorded its apreciation of his high character and valuable service.

The Board of Directors takes this opportunity to express its appreciation of the integrity, efficiency, and united efforts displayed by your officers and employes in the discharge of their duties.

By order of the Board of Directors.

CHARLES H. MARKHAM,
Chairman of the Board.

Table 2—Income Statement for the Years Ended December 31, 1927 and 1926

	1927	Per Cent. of Total Operating Revenues	1926	Per Cent. of Total Operating Revenues	+Increase —Decrease
Average miles operated	1,911.78	.....	1,915.27	..... —	3.49
Railway Operating Revenues:					
Rail-Line Transportation:					
Freight	$20,758,147.38	75.10	$23,078,804.36	72.52 —	$2,320,656.98
Passenger	4,422,903.93	16.00	5,907,478.35	18.56 —	1,484,574.42
Excess baggage	28,868.35	.10	37,028.04	.12 —	8,159.69
Mail	530,018.59	1.92	502,053.27	1.58 +	27,965.32
Express	880,621.11	3.19	1,029,949.80	3.24 —	149,328.69
Milk	11,929.60	.04	16,306.49	.05 —	4,376.89
Other passenger-train	59,122.27	.21	116,177.55	.36 —	57,055.28
Switching	342,553.89	1.24	357,027.63	1.12 —	14,473.74
Special service train	19,176.00	.07	21,833.50	.07 —	2,657.50
Total rail-line transportation revenue	$27,053,341.12	97.87	$31,066,658.99	97.62 —	$4,013,317.87
Incidental Operating Revenue:					
Dining and buffet	$ 143,127.72	.52	$ 196,133.24	.62 —	$ 53,005.52
Hotel and restaurant	4,283.37	.01	5,708.76	.02 —	1,425.39
Station, train and boat privileges	14,376.35	.05	26,039.88	.08 —	11,663.53
Parcel room	97.20	.....	85.30	..... +	11.90
Storage—freight	79,068.78	.29	82,213.44	.26 —	3,144.66
Storage—baggage	884.72	.....	1,032.62	..... —	147.90
Demurrage	57,958.89	.21	119,621.66	.38 —	61,662.77
Power	5,198.96	.02	6,049.53	.02 —	850.57
Rents of buildings and other property	5,457.47	.02	4,742.42	.01 +	715.05
Miscellaneous	225,450.27	.82	259,921.38	.81 —	34,471.11
Total incidental op'g revenue	$ 535,903.73	1.94	$ 701,548.23	2.20 —	$ 165,644.50
Joint Facility Operating Revenue:					
Joint facility—Cr.	$ 53,397.63	.19	$ 58,242.68	.18 —	$ 4,845.05
Joint facility—Dr.	*1,332.55*	.....	*1,080.61*	..... —	251.94
Total joint facility op'g revenue	$ 52,065.08	.19	$ 57,162.07	.18 —	$ 5,096.99
Total railway operating revenues	$27,641,309.93	100.00	$31,825,369.29	100.00 —	$4,184,059.36
Railway Operating Expenses:					
Maintenance of way and structures	$ 3,586,921.40	12.98	$ 4,496,326.11	14.13 —	$ 909,404.71
Maintenance of equipment	4,934,292.26	17.85	5,498,448.52	17.28 —	564,156.26
Traffic	899,806.03	3.26	931,545.49	2.93 —	31,739.46
Transportation—rail line	10,222,223.50	36.98	11,659,307.83	36.63 —	1,437,084.33
Miscellaneous operations	178,128.22	.64	240,236.34	.75 —	62,108.12
General	1,191,069.38	4.31	1,192,509.54	3.75 —	1,440.16
Transportation for investment—Cr.	*66,814.31*	*.24*	*245,835.73*	*.77* +	179,021.42
Total railway operating expenses	$20,945,626.48	75.78	$23,772,538.10	74.70 —	$2,826,911.62
Net revenue from r'y operations	$ 6,695,683.45	24.22	$ 8,052,831.19	25.30 —	$1,357,147.74
Railway tax accruals	$ 1,555,181.83	5.63	$ 1,519,851.76	4.78 +	$ 35,330.07
Uncollectible railway revenues	12,088.85	.04	9,300.69	.03 +	2,788.16
Railway operating income	$ 5,128,412.77	18.55	$ 6,523,678.74	20.49 —	$1,395,265.97
Additions to Railway Operating Income:					
Hire of freight cars—credit bal.	$ 18,945.85	.....	.....	..... +	$ 18,945.85
Rent from locomotives	17,724.74	.....	$ 28,668.53	..... —	$ 10,943.79
Rent from passenger-train cars	167,277.73	.....	143,631.24	..... +	23,646.49
Rent from work equipment	13,108.15	.....	24,048.44	..... —	10,940.29
Joint facility rent income	111,093.16	.....	103,790.10	..... +	7,303.06
Total additions to railway operating income	$ 328,149.63	.....	$ 300,138.31	..... +	$ 28,011.32
Deductions from Railway Operating Income:					
Hire of freight cars—debit bal.	.....	.....	$ 366,757.94	..... —	$ 366,757.94
Rent for locomotives	$ 7,644.48	.....	13,749.93	..... —	6,105.45
Rent for passenger-train cars	192,446.38	.....	205,308.78	..... —	12,862.40
Rent for work equipment	4,541.15	.....	5,317.14	..... —	775.99
Joint facility rents	200,857.03	.....	279,391.78	..... —	78,534.75
Total deductions from railway operating income	$ 405,489.04	.....	$ 870,525.57	..... —	$ 465,036.53
Net railway operating income—carried forward	$ 5,051,073.36	.....	$ 5,953,291.48	..... —	$ 902,218.12

	1927	1926	+Increase —Decrease
Net railway operating income—brought forward	$5,051,073.36	$5,953,291.48	—$ 902,218.12
Non-Operating Income:			
Income from lease of road	$ 45,359.64	$ 45,329.64	+$ 30.00
Miscellaneous rent income	112,270.44	106,908.74	+ 5,361.70
Miscellaneous non-operating physical property	3,235.24	*19,695.17*	+ 22,930.41
Dividend income (Table 5)	491,433.25	1,012,575.00	— 521,141.75
Income from funded securities (Table 5)	156,633.82	166,433.00	— 9,799.18
Income from unfunded securities and accounts	42,215.03	123,718.23	— 81,503.20
Income from sinking and other reserve funds	10,067.28	.....	+ 10,067.28
Miscellaneous income	3.00	7.00	— 4.00
Total non-operating income	$ 861,217.70	$1,435,276.44	—$ 574,058.74
Gross income	$5,912,291.06	$7,388,567.92	—$1,476,276.86
Deductions from Gross Income:			
Expenses of miscellaneous operations	.....	$ 151.31	—$ 151.31
Rent for leased roads (Table 7)	$ 355,627.01	373,243.23	— 17,616.22
Miscellaneous rents	139,493.41	142,377.28	— 2,883.87
Interest on funded debt (Table 6)	3,059,663.66	3,038,127.66	+ 21,536.00
Interest on nonnegotiable debt to affiliated companies	25,990.47	36,584.68	— 10,594.21
Interest on unfunded debt	9,815.72	7,394.46	+ 2,421.26
Amortization of discount on funded debt	87,162.34	95,454.42	— 8,292.08
Miscellaneous income charges	18,379.00	19,842.12	— 1,463.12
Total deductions from gross income	$3,696,131.61	$3,713,175.16	—$ 17,043.55
Income balance transferred to credit of Profit and Loss	$2,216,159.45	$3,675,392.76	—$1,459,233.31

[Advertisement]

Financial News

(*Continued from page 890*)

directors of this company and the Jacksonville & Havana on April 6 approved the consolidation of the two railroads, subject to the approval of the stockholders, the Illinois Commerce Commission and the Interstate Commerce Commission. The stockholders will meet at Springfield, Ill., on June 14. It is planned to increase the capital stock of the merged line, which will be known as the Chicago, Springfield & St. Louis, to $3,000,000. The consolidation will be effected by the sale of the Jacksonville & Havana to the Chicago, Springfield & St. Louis, stockholders of the former company receiving stock in the latter company to the amount of their individual holdings on a par value basis.

DELAWARE & HUDSON.—*Abandonment.*—The Interstate Commerce Commission has made public a proposed report by Examiner O. D. Weed recommending that the commission deny this company's application for authority for the abandonment of the Honesdale branch, from Carbondale to Honesville, Pa., 27.12 miles. The report says that it would seem that the amount of traffic available on 20 miles of the line might pay the cost of economical operation, particularly if the passenger train were taken off and a passenger coach attached to the daily freight train.

KANSAS CITY SOUTHERN.—*Anti-Trust Proceedings.*—The Interstate Commerce Commission has authorized R. C. Duff of the Waco, Beaumont, Trinity & Sabine Railway, and a large number of other Texas organizations to intervene in the proceedings on its complaint against this company alleging violation of the Clayton law in connection with its acquisition of stock of the Missouri—Kansas—Texas and the St. Louis Southwestern. The commission has also authorized Walter E. Meyer, representing minority stockholders of the Cotton Belt, to intervene in the proceedings and in the related complaint against the M.-K.-T.

KANSAS CITY SOUTHERN.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control by lease of the Kansas City & Grandview, of which it owns all the stock except directors' shares. The Kansas City & Grandview also applied for authority to issue $3,000,000 of bonds, to be guaranteed by the K. C. S. and to be sold at 94½ if they bear interest at 4½ per cent or at par if they bear interest at 5 per cent.

LONG ISLAND.—*Declares Dividend.*—This company has declared a dividend of 4 per cent on its capital stock of record April 20, payable May 1—the first dividend to be declared by it since 1896. Over 99 per cent of the stock of this company is owned by the Pennsylvania.

LONGVIEW, PORTLAND & NORTHERN.—*Trackage Rights Over.*—The Interstate Commerce Commission has authorized the Northern Pacific, the Great Northern and the Oregon-Washington Railroad & Navigation to operate under trackage rights over the line of the Longview, Portland & Northern between Longview Jct., Ore., and Olequa, a distance of 21 miles.

LOUISVILLE & NASHVILE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of $49,503,000 of first and refunding mortgage 4½ per cent bonds, Series C.

NEW YORK CENTRAL.—*Office of Chairman Discontinued.*—The board of directors of the New York Central Railroad at their monthly meeting on April 11, voted to discontinue the office of chairman of the board, heretofore filled by the late Senator, Chauncey M. Depew, who died April 5. They also voted to change the title of the finance committee to executive committee.

NORTHERN PACIFIC.—*Abandonment.*—On February 16 the Interstate Commerce Commission authorized this company to abandon its old main line, 16 miles, in Sanders county, Mont., provided that it first build a highway from White Pine to a station on the new route. This order is now supplemented to permit abandonment prior to completion of this highway, the company agreeing to proceed with diligence to construct the highway. The change is based on the applicant's desire to use the rail in the abandoned line for construction purposes, and also to utilize a portion of the abandoned roadway as a right-of-way for the new highway.

OREGON, CALIFORNIA & EASTERN.—*Election of Directors.*—New directors of this company, owned jointly by the Great Northern and the Southern Pacific, were elected at Klamath Falls, Ore., on April 6 as follows: Thomas Ahern assistant general manager of the Southern Pacific at Sacramento, Cal.; James G. Wilson, vice-president of the O. C. & E. at Portland, Ore.; J. H. O'Neill, general manager of the Great Northern at Seattle, Wash.; L. C. Gilman, vice-president of the Great Northern at Seattle. George W. Kelly, of western traffic manager of the Great Northern at Seattle. George W. Kelly, of Westfir, Ore., was re-elected as a director.

PENNSYLVANIA.—*Abandonment.*—The Interstate Commerce Commission has authorized this company and its lessee, the Grand Rapids & Indiana, to abandon a branch of the latter company extending from Walloon Lake Jct., Mich., to Walloon Lake, one mile. Operation of the line was discontinued in 1923.

PENNSYLVANIA.—*Annual Meeting.*—The eighty-second annual meeting of the stockholders of the Pennsylvania Railroad Company was held in Philadelphia on April 10. The chairman then called attention to the proposed lease to the Pennsylvania for 999 years, of the property and franchises of the Pennsylvania Tunnel & Terminal Railroad Company, as referred to in the general remarks of the annual report. The property of the Tunnel Company includes Pennsylvania Station in New York City, together with the connecting tubes under the Hudson river, Manhattan island and the East river. The Pennsylvania Railroad Company owns the entire capital stock and funded debt of the Tunnel Company. Following the chairman's explanatory remarks, A. J. County, vice president in charge of treasury, accounting and corporate work, offered a resolution formally submitting the lease to the stockholders, to date from July 1, 1928. In accordance with this resolution, an election of the stockholders was immediately declared open. The results will be certified to the board of directors through the secretary.

PENNSYLVANIA. — *Stock Issue.* —This company has applied to the Interstate Commerce Commission for authority to issue $62,408,250 of additional capital stock, to be offered to stockholders at par to the extent of 12½ per cent of their present holdings.

President's Remarks.—General W. W. Atterbury, president, then addressed the meeting with reference to the proposed issue of $17,500,000 of new capital stock for sale to the company's employees, as authorized by the directors at their meeting on March 28, subject to approval by the stockholders. General Atterbury, who spoke extemporaneously, referred to the successful efforts of the management, during recent years, in bringing about increasingly harmonious and satisfactory relations with the employees, and the beneficial effects resulting to the company. He stated that the time had now arrived when the management desired to ask the co-operation of the stockholders in continuing these efforts, and cementing still more closely the ties between the employees and the company, by making it possible for an increased number of employees to become stockholders. This, he said, was the purpose in asking approval of the stockholders for the proposed issue of stock for sale to employees. General Atterbury then offered the following resolution, which was unanimously adopted:

"Resolved that it is the sense of this meeting that the Board of Directors be and they are hereby requested to give further consideration to the said plan, and, in the event of its adoption by the Board, to call a special meeting of the stockholders of the Company at such time and place as may be prescribed by the Board, at which meeting the stockholders will have the privilege, either in person or by proxy, of voting upon the question of their consent to the said plan."

At the conclusion of General Atterbury's remarks, David E. Williams offered a resolution, which was adopted, requesting the chairman of the meeting to appoint a committee of seven stockholders for the purpose of making nominations to fill the vacancies resulting from the expiring terms of three directors, namely, Samuel Rea, Charles E. Ingersoll and Edgar C. Felton. The meeting then adjourned. The nominations of this committee will be submitted to a vote of the stockholders at the annual election on April 24th.

SEABOARD AIR LINE.—*Denial of Acquisition Application Recommended.*—The Interstate Commerce Commission,

has made public a proposed report by Examiner Thomas F. Sullivan, recommending that the commission deny this company's application for authority to acquire control of the South Georgia, extending from Adel, Ga., to Hampton Springs, Fla., 81.6 miles. After pointing out that the Seaboard has been engaged for several years in a program of acquisition and construction and that its earnings dropped sharply in 1927, the examiner says that "until such time as the Seaboard is in a position to show that the earnings for 1926 were approximately normal and not exceptional, it should not be permitted to assume additional burdens, especially when, as in the instant case, the benefit to be derived from such assumption is doubtful."

SOUTHERN PACIFIC.—*Valuation Hearing.*—The Interstate Commerce Commission has assigned the case involving the valuation of the Southern Pacific system properties for further hearing at Washington beginning on May 1 before Examiner Faris.

TENNESSEE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $30,000 general mortgage 6 per cent bonds to be sold at not less than par. Authentication and delivery of these bonds were authorized in 1926, since which time they have been held in its treasury.

TENNESSEE CENTRAL.—*Bonds.*—The Interstate Commerce Commission has authorized the issuance of $410,000 first mortgage 6 per cent bonds, series B, to be pledged and repledged as collateral security for short-term notes; time limit, June 30, 1930. The road had similar authority which expired on December 31 last. Last October it was authorized to sell these bonds, but was not able to secure what it considered a fair price. It now finds that by securing the authority to use such bonds as security for short term notes, it is able to obtain funds for corporate purposes at a low rate of interest.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*Authority to Issue Capital Stock.*—The Interstate Commerce Commission has authorized this company to issue 2,058 shares of $100 par capital stock to the Chicago & Eastern Illinois, the latter company assuming liability as guarantor on the payment of interest and sinking fund requirements on one-sixteenth of the terminal company's $23,790,000 of general mortgage 4 per cent gold bonds. This authorization will enable the C. & E. I. to become a member in the terminal railroad on a basis of equality with 15 other railroads.

THORNTON & ALEXANDRIA.—*Abandonment.*—The Interstate Commerce Commission has authorized the abandonment of the line of this company between Thornton, Ark., and Rock Island Jct., 13 miles. Applicant desired also to abandon the line from Rock Island Jct. to Tinsman, 12 miles, but this part of the application has been denied.

WABASH.—*Bond Offering.*—Kuhn, Loeb & Co. announced an offering on March 22 of $17,867,000 refunding and general mortgage 4½ per cent bonds, series C, maturing April 1, 1978 at 95½ per cent, giving a yield to maturity of about 4.74 per cent. The issue is for the purpose of reimbursing the treasury for capital expenditures heretofore made and to provide additional funds for capital purposes.

WABASH.—*Discharge of Receiver.*—Edward B. Pryor, formerly vice-president of the Wabash and now president of the State National Bank of St. Louis, was formally discharged as receiver for the Wabash Railroad Company by Federal Judge C. B. Faris at St. Louis, Mo., on March 29. Although Mr. Pryor has served as a receiver of this company since December 18, 1911, his duties were virtually concluded on July 21, 1915, when the railroad was sold and reorganized as the Wabash Railway Company.

DULUTH & IRON RANGE.—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of $1,309,624, as compared with $1,750,553 in 1926.

Selected items from the income statement follow:

	1927	1926
Railway Operating Revenues	$6,648,644	$7,041,389
Maintenance of way	1,199,828	1,073,965
Maintenance of equipment	1,351,349	1,312,296
Transportation	1,853,252	1,909,974
Total Operating Expenses	$4,700,892	$4,615,629
Operating ratio	70.70	65.55
Net Revenue from Operations	$1,947,752	$2,425,760
Railway tax accruals	538,412	550,602
Railway operating income	$1,409,314	$1,875,129
Net Railway Operating Income	$1,440,967	$1,917,645
Gross Income	$1,911,120	$2,346,384
Interest on funded debt	407,550	407,550
Total Deductions from Gross Income	$601,496	$595,831
Net Income	$1,309,624	$1,750,553

Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

Missouri, Oklahoma & Gulf	$5,812,877	1919
Missouri, Oklahoma & Gulf of Texas	243,325	1919
Cornwall	772,000	1917
St. Joseph Terminal	605,590	1917
Appalachian	172,500	1920

Dividends Declared

Pittsburgh & West Virginia.—Common, 1½ per cent, quarterly; payable April 30 to holders of record April 17.

Average Price of Stocks and of Bonds

	Apr. 10	Last week	Last year
Average price of 20 representative railway stocks	121.94	123.10	110.81
Average price of 20 representative railway bonds	96.73	96.74	94.73

Officers

Executive

T. M. Hayes has been appointed assistant to the president of the Wabash, with headquarters at St. Louis, Mo.

E. B. Sloan, chief engineer of the Southern Pacific of Mexico, with headquarters at Guadalajara, Jal., has in addition been appointed assistant to the president.

E. W. Coughlin has been appointed district manager of District No. 5 of the Car Service Division, American Railway Association, with headquarters at St. Louis, Mo., succeeding J. W. Riley, transferred.

T. C. Norris, former premier of the province of Manitoba and now a member of the Manitoba legislature representing Lansdowne, has been appointed a member of the Board of Railway Commissioners of Canada. His appointment fills the vacancy caused by the retirement of A. C. Boyce late in 1927.

Arthur E. Wright, secretary, assistant to the president and superintendent of the Manufacturers Railway and the St. Louis & O'Fallon, with headquarters at St. Louis, Mo., has been elected president and general manager of the two railroads, succeeding **William Cotter,** whose resignation because of ill health was accepted by the board of directors on April 4. **Ray C. Harrison,** purchasing agent of both railroads, with headquarters at St. Louis, has in addition been elected secretary of the company.

Robert S. Henry, who has been promoted to assistant to the vice-president and traffic manager of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., will in addition continue his duties as director of public relations of that railroad. He was born on October 20, 1889, at Nashville

Robert S. Henry

and attended the Nashville public schools and the Wallace Preparatory School, entering Vanderbilt University in 1905. Mr. Henry graduated in 1911 with a law degree. During the war he served with the Thirty-first infantry division and later with the Thirteenth field artillery of the Fourth division with the rank of captain. He was for a time with the Army of Occupation in Germany and following that service he spent some months in the study of law in Queens' College at Cambridge, England. Mr. Henry entered the service of the N., C. & St. L. as director of public relations in 1921.

Financial, Legal and Accounting

J. C. Maguire has been appointed assistant treasurer of the Indiana Harbor Belt, with headquarters at Gibson, Ind.

G. F. Gerlach has been appointed assistant treasurer of the Chicago Junction and the Chicago River & Indiana, with headquarters at the Union Stock Yards, Chicago.

H. F. Farrell, auditor of overcharge claims of the Pere Marquette, with headquarters at Detroit, Mich., has been appointed assistant auditor of traffic accounts, with headquarters at the same point.

R. G. Shorter, acting comptroller of the Fruit Growers Express, with headquarters at Washington, D. C., has been appointed comptroller, with headquarters at the same point.

Ray C. Harrison, who has been elected purchasing agent and secretary of the St. Louis & O'Fallon and the Manufacturers Railway, with headquarters at St. Louis, Mo., was born on January 21, 1890, at St. James, Mo. He entered railway service on July 1, 1909, with the

Ray C. Harrison

St. Louis-San Francisco, and was employed by the Missouri-Kansas-Texas from November, 1911, to December, 1912. Mr Harrison then became connected with the American Refrigerator Transit Company at St. Louis, Mo., where he remained until September, 1919. In 1920 he was appointed purchasing agent of the St. Louis & O'Fallon and the Manufacturers Railway, with headquarters at St. Louis. Mr. Harrison's election as purchasing agent and secretary became effective on April 4.

M. H. Potter has been appointed assistant freight claim agent of the Central of New Jersey, with headquarters at New York, succeeding **F. L. Ayres,** promoted.

Theodore J. Pausch, assistant auditor of disbursements of the Michigan Central, with headquarters at Detroit, Mich., has been promoted to auditor of disbursements, with headquarters in the same city, succeeding **Fred W. Sparling** who has resigned to engage in private business. **Edwin A. Hancock,** district station accountant, has been promoted to assistant auditor of disbursements to replace Mr. Pausch.

Operating

H. J Hadden, purchasing agent of the Chicago, Springfield & St. Louis and the Jacksonville & Havana, with headquarters at Springfield, Ill., has been appointed assistant to the general manager with headquarters at the same point.

J. W. Evens, formerly superintendent of the Texas Central district of the Missouri-Kansas-Texas at Waco, Tex., and since 1922 special representative of the vice-president and general manager, with headquarters at Dallas, Tex., retired from active service on March 1. Mr. Evens was born at De Soto, Mo., on January 17, 1860, and entered railway service in the shops of the St. Louis, Iron Mountain & Southern (now part of the Missouri Pacific) at De Soto in 1875. In 1899 he was appointed a trainmaster on the Wabash at Decatur, Ill., becoming master mechanic on the Alabama Great Southern (now part of the Southern) in 1907. Mr. Evens was promoted to superintendent at Birmingham, Ala., in 1908 where he remained until 1914 when he was appointed trainmaster of the Katy at Oklahoma City, Okla. He was promoted to superintendent of the Texas Central district of the Katy at Waco in 1915.

A. J. Chester, superintendent of the Louisiana division of the Texas & Pacific, with headquarters at Alexandria, La., has been appointed general superintendent with headquarters at Dallas, Tex., succeeding **Harry D. Earl,** promoted, and **R. Wynne,** joint superintendent of the Denton division of the Missouri-Kansas-Texas and the Texas & Pacific, with headquarters at Denton, Tex., has been transferred to the Louisiana division to succeed Mr. Chester. **A E. Pistole,** superintendent of the Rio Grande division, of the Texas & Pacific, with headquarters at Big Spring, Tex., has been transferred to the Denton division succeeding Mr. Wynne. **C. C. Kilway,** trainmaster at Bonham, Tex., has been promoted to superintendent of the Rio Grande division replacing Mr. Pistole.

George W. Simpson, who has been promoted to superintendent of the Arizona division of the Atchison, Topeka & Santa Fe, with headquarters at Needles, Cal., was born on August 7, 1871, at Plano, Tex. He entered railway service in 1893 as a brakeman on the Nevada Southern (now a part of the Santa Fe). During the latter part of 1894 Mr. Simp-

George W. Simpson

son served as a clerk on the Kansas & Colorado (now a part of the Santa Fe), entering the service of the Santa Fe, as a brakeman on the Coast Lines in December of the same year. He has been with the Coast lines of the Santa Fe continuously since that time, being advanced to conductor in January, 1898, and to ticket inspector in May, 1903. In February, 1906, Mr. Simpson was promoted to general inspector of transportation, a position he held until his further promotion to trainmaster on the Valley division, with headquarters at Fresno, Cal., in October, 1909. In July, 1926, he was promoted to assistant superintendent of the Valley division, with headquarters as before at Fresno. Mr. Simpson's advancement to superintendent of the Arizona division became effective on April 1.

D. E. Crouser, trainmaster of the Alexandria subdivision of the Louisiana division of the Texas & Pacific, with headquarters at Alexandria, La., has been transferred to the Rio Grande division, with headquarters at Big Spring, Tex. **L. C. Galbraith** has been appointed trainmaster of the Alexandria subdivision, succeeding Mr. Crouser. **P. McDermott** has been appointed terminal trainmaster on the Ft. Worth division, with jurisdiction over the Ft. Worth (Tex.) terminal.

Joseph W. Walker, who has been promoted to assistant to the general manager of the Coast Lines of the Atchison, Topeka & Santa Fe, with headquarters at Fresno, Cal., has completed 46 years of service in the engineering and operating departments of that railroad. He was born at Quincy, Ill., on October 24, 1863, and entered railway service in 1882

in the bridge and building department of the Santa Fe. In January, 1883, Mr. Walker was appointed assistant agent, and for the next 17 years he served successively in that position and as a clerk in the office of the superintendent, as freight clerk in the auditor's office, as joint agent of the Santa Fe and the Southern Pacific at Deming, N. M., as agent for the Santa Fe at Albuquerque,

Joseph W. Walker

N. M., and as chief clerk to the general superintendent of the lines west of Albuquerque. He was promoted to superintendent of terminals at San Francisco in April, 1900, and on April 1, 1904, he was further promoted to superintendent of the Valley division with headquarters at Fresno. Mr. Walker's promotion to assistant to the general manager became effective on April 1.

C. W. Cummings, who has been appointed superintendent of car service of the Boston & Albany, with headquarters at Springfield, Mass., was born on June 13, 1886, at Merrimac, Mass. He entered railway service in November, 1911, with the Union Pacific at Boston, Mass. In February, 1914, he entered the serv-

C. W. Cummings

ice of the Boston & Albany as a clerk in the valuation department and was made chief clerk, valuation department, on May 1, 1915. He was transferred to the vice-president's office on June 23, 1917, as secretary to the vice-president and on February 15, 1919, was appointed chief clerk to the vice-president, serving in this capacity up until the time of his recent appointment as superintendent of car service.

N. H. Bogue, chief engineer and superintendent of the Oregon, California & Eastern, with headquarters at Klamath Falls, Ore., has been appointed general manager, with headquarters at the same point.

S. McElroy, assistant superintendent of the Port Arthur division, of the Canadian National, with headquarters at Port Arthur, Ont., has been transferred to the Kamloops division, with headquarters at Kamloops Junction, B. C.

Traffic

F. B. Mc Kay, general freight and passenger agent of the Texas Midland, with headquarters at Terrell, Tex., has been appointed assistant general freight agent of the Southern Pacific lines in Texas and Louisiana. with headquarters at Dallas, Tex., following the purchase of the Texas Midland by the Southern Pacific. Mr. McKay will have charge of solicitation on the former Texas Midland between Paris, Tex., and Ennis.

Thomas E. Sands, who has been promoted to general freight traffic manager of the Minneapolis, St. Paul & Sault Ste Marie, with headquarters at Min-

Thomas E. Sands

neapolis, Minn., has completed nearly 40 years of service in the traffic department of that company. He was born on January 1, 1869, at Albany, N. Y., and entered railway service on June 25, 1886, with the Chicago, St. Paul, Minneapolis & Omaha. Two years later Mr. Sands became contracting freight agent on the Soo line, serving successively until April 15, 1909, as traveling freight agent, chief clerk in the freight traffic department and assistant general freight agent, when he was advanced to general freight agent, with headquarters at Minneapolis. He was promoted to freight traffic manager of the Soo line on April 1, 1916. His appointment as general freight traffic manager became effective on April 2.

H. C. Carson, division passenger agent on the Michigan Central at Saginaw, Mich., has been promoted to assistant general passenger agent, with headquarters at Chicago, succeeding **R. B. Holmes,** who has been transferred to Detroit, Mich. Mr. Holmes replaces **A. V. Ulrich** who has been appointed to the newly created position of special representative of the passenger department, with headquarters at Detroit.

R. N. Golden, who has been appointed general freight agent of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., was born on June 21, 1878, at Diamond Lake, Ill. He attended high school in Chicago and entered railway service on November 6, 1906, on the Chicago & North Western. On September 1, 1914, he entered the employ of the Minneapolis & St. Louis. During the World War Mr. Golden was

R. N. Golden

successively with the United States Railroad Administration at Washington, D. C., with the United States Shipping Board and with the United States Army Reserve Depot at Columbus, Ohio. He reentered railway service on March 1, 1920, as assistant general freight agent of the Minneapolis & St. Louis at Minneapolis. Until his appointment to the Soo line, on April 2, Mr. Golden was general freight agent of the M. & St. L., with headquarters at Minneapolis, to which position he was promoted in August, 1925.

Edward G. Clark, who has been promoted to freight traffic manager of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., was born on May 2, 1872, at Howell, Mich. He graduated from high school at Minneapolis in 1891 and two years later entered the service of the Western Transit Company at that point as a stenographer and clerk. During 1896 and 1897 he was a stenographer on the Wisconsin Central (now part of the Soo line) at Minneapolis and Milwaukee, Wis., becoming chief clerk in the general freight office at Minneapolis in September, 1897. From May 1, 1899, to December 1, 1902, Mr. Clark served as

New England agent, with headquarters at Boston, Mass., and as general agent at Milwaukee and he was then promoted to assistant general freight agent at Milwaukee. He was transferred to Minneapolis in April, 1909, where he remained

Edward G. Clark

until April, 1916, when he was promoted to general freight agent, with headquarters at Minneapolis. Mr. Clark's promotion to freight traffic manager became effective on April 2. His entire railroad service, 32 years, has been with the Soo line.

Engineering, Maintenance of Way and Signaling

R. L. Sims, engineer of maintenance of the Wyoming district of the Chicago, Burlington & Quincy, with headquarters at Alliance, Neb., has been transferred to the Illinois district, with headquarters at Galesburg, Ill.

James G. Taylor, special engineer of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has retired under the pension rules of that company after nearly 48 years of continuous service with the Frisco. Mr. Taylor was born on March 2, 1864, at Cincinnati, Ohio, and entered railway service at the age of 14 years as a water boy for an extra gang at Alton, Ill. In April, 1880, he became a flagman for a surveying party on the Frisco near Wichita, Kan. Mr. Taylor advanced through a number of minor positions in the engineering department of the Frisco during the next 23 years and in 1903 he was promoted to resident engineer at Pierce City, Mo. In 1904 he was appointed division engineer at Springfield, Mo., then being transferred to Joplin, Mo., in 1905 and later being appointed resident engineer at Monett, Mo., in 1906, district engineer at Monett in 1910 and district engineer at Springfield in 1912. Mr. Taylor served successively as superintendent of the Ozark and Western divisions, with headquarters at Springfield and Enid, Okla., respectively during 1918 and 1919, and in 1920 he returned to the engineering department as division engineer at Sapulpa, Okla. He was appointed special engineer in 1924.

H J. Black, inspecting engineer in the office of the engineer of maintenance of way of the Central region of the Canadian National, at Toronto, Ont., has been promoted to division engineer of the Hornepayne division, with headquarters at Hornepayne, Ont., succeeding **H. W. Fleming** who has been transferred to the St. Lawrence division, with headquarters at Montreal, Que. **A. D. W. Cuthbert,** assistant district engineer of the Montreal district, with headquarters at Montreal, has been appointed division engineer of the Cochrane division with headquarters at Cochrane, Ont., replacing **James Ferguson** who has been transferred to the London division, with headquarters at London, Ont. **Ernest R. Logie,** assistant engineer in the office of the district engineer of the Southern Ontario district at Toronto, Ont., has been promoted to division engineer of the Belleville division, with headquarters at Belleville, Ont. **W. E. Mellor,** assistant engineer in the office of the district engineer of the Southern Ontrio district at Toronto, has been promoted to division engineer of the St. Thomas division, with headquarters at St. Thomas, Ont. **W. A. Siegner,** assistant district engineer on the Southern Ontario district at Toronto, has been appointed division engineer of the Stratford division, with headquarters at Stratford, Ont. **L. I. Stone,** assistant district engineer on the Southern Ontario district at Toronto, has been appointed division engineer of the Toronto Terminals division, with headquarters at Toronto.

Frederick E. Morrow, who has been promoted to chief engineer of the Belt Railway of Chicago and the Chicago & Western Indiana, with headquarters at Chicago, was born on October 27, 1880, at Kokomo, Ind. He graduated from a course in civil engineering at Purdue University in 1904 and entered the engineering department of the Illinois Steel Company in the same year. In

Frederick E. Morrow

November, 1904, he entered railway service as a rodman on the Chicago & North Western. Until April, 1907, he acted in that capacity and as an instrument man and assistant engineer on the Northwestern and he then became field engineer in the track and roadway division of the Board of Supervising Engineers of the Chicago Traction Lines during the rehabilitation of that street railway system. In April, 1910, Mr. Morrow was appointed office engineer of the Chicago & Western Indiana, with headquarters at Chicago, being advanced to assistant chief engineer of that railroad and the Belt Railway on September 1, 1915. His promotion to chief engineer became effective on April 3.

Mechanical

E. B. DeVilbiss, superintendent of motive power on the Pennsylvania, with headquarters at Williamsport, Pa., has been appointed superintendent of motive power of the New Jersey division. **Eliot Sumner,** superintendent of motive power with headquarters at New York, has been appointed assistant to the general superintendent of motive power of the Eastern region.

B. P. Johnson, who has been promoted to mechanical superintendent of the lines of the Northern Pacific east of Paradise, Mont., has completed near-

B. P. Johnson

ly 40 years of railway service, all with the Northern Pacific. He was born on October 1, 1869, at Mt. Holly, N. J., and after attending grade school in Camden, N. J., served a five-year apprenticeship as machinist in jobbing shops at Philadelphia, Pa., and Camden. Mr. Johnson entered railway service on the Northern Pacific on December 20, 1888, as a round house laborer at Glendive, Mont. A year later he became locomotive fireman and served at Glendive in that capacity and as a locomotive engineman until September 1, 1903, when he was promoted to road foreman of engines at the same point. On April 1, 1908, he was again promoted to master mechanic at Glendive, where he remained until January 15, 1916, when he was transferred to Seattle, Wash. Mr. Johnson was promoted to general master mechanic of the lines of the Northern Pacific between Mandan, N. D., and Paradise, Mont., with headquarters at Livingston, Mont., on June 15, 1923, and his advancement to mechanical superintendent became effective on March 15.

Bruce M. Swope, master mechanic of the Pennsylvania with headquarters at Columbus, O., has been appointed superintendent of motive power, Central Pennsylvania division, with headquarters at Williamsport, Pa. Mr. Swope was born on June 13, 1885, at Altoona, Pa. He was graduated in mechanical engineering from Lehigh University in 1907. On July 1, 1908, he entered the service of the Pennsylvania as a special apprentice at Altoona, Pa. In 1912 he was appointed motive power inspector, Conemaugh division, and later served in the same capacity at the Pitcairn car shop, Pittsburgh division. In 1916 he was assigned to special work in the office of the superintendent of motive power, Western Pennsylvania division, at Pittsburgh, Pa. In 1917 he was promoted to assistant master mechanic at Renovo,

Bruce M. Swope

Pa.; in 1920 to assistant engineer of motive power, Lake division, Cleveland, O.; in May, 1923, to assistant engineer motive power, Southwestern region, office of general superintendent motive power, St. Louis, Mo.; in February, 1924, to master mechanic, St. Louis division, with headquarters at Terre Haute, Ind., and in November, 1924, to master mechanic, Buffalo division, with headquarters at Olean, N. Y. He was transferred to Columbus, O., on March 1, 1927, as master mechanic, serving in this capacity until the time of his recent appointment to superintendent of motive power.

Guy F. Egbers, who has been promoted to general master mechanic of the Northern Pacific, with headquarters at Livingston, Mont., has completed nearly 41 years in the service of that railroad. He was born on January 6, 1869, at Carthage, Ill., and entered railway service at the age of 18 years as a fireman and hostler on the Northern Pacific. Mr. Egbers was advanced to engineman on the Idaho division in September, 1890, being promoted to road foreman of engines on that division on September 1, 1904. In May, 1907, with the creation of the Pasco division, he was promoted to assistant master mechanic, with headquarters at Pasco, Wash., where he remained until 1909 when he was further promoted to master mechanic of that division. On September 3, 1917, Mr. Egbers joined the Russian Railway Service Corps, serving with that unit in Siberia until October, 1919, when he reentered the service of the Northern Pacific as master mechanic of the Idaho

Guy F. Egbers

division, with headquarters at Spokane, Wash. Mr. Egbers was promoted to general master mechanic of the Central district, with jurisdiction extending from Mandan, N. D., to Paradise, Mont., on March 15.

Purchases and Supplies

H. L. Cunningham has been appointed purchasing agent of the Midland Valley and the Kansas, Oklahoma & Gulf, with headquarters at Muskogee, Okla.

Obituary

Alfred Stevens, special inspector, telegraph department, of the Baltimore & Ohio, died on March 28, after a two day illness of pneumonia. Mr. Stevens was born in Newark, O., on January 21, 1855. He entered the service of the Western Union Telegraph Company in 1872 and came into the joint employ of the Baltimore & Ohio on November 1, 1884, as line foreman. He was appointed general foreman on July 1, 1917, and became inspector on September 1, 1919.

James O. Phillippi, assistant general freight agent of the Missouri Pacific, with headquarters at Omaha, Neb., from 1888 to 1907, died at the age of 83 years at San Diego, Cal., on April 3. Mr. Phillippi was assistant general freight agent of the Atchison, Topeka & Santa Fe at Topeka, Kan., from 1884 to 1888.

James A. Gleason, superintendent of telegraph of the Chesapeake & Ohio at Richmond, Va., died recently. Mr. Gleason was born on February 10, 1859, at Portsmouth, Va. He entered railway service in 1874 as clerk and assistant operator on the Charlotte, Columbia & Augusta (Southern) at Charlotte, N. C. From 1876 to 1877 he served with the Richmond, New River & Chesapeake (Southern); from 1877 to 1882 with the United States Signal Service on government lines at Washington, D. C., and in Texas; 1882 to 1886 as train dispatcher on the Richmond & Danville (Southern). In 1887 he served as dispatcher on the Norfolk & Western, and from 1888 to 1891 he served in the same capacity with the Chesapeake & Ohio, returning to the Norfolk & Western as train dispatcher and night chief dispatcher in the latter year. From 1898 to February, 1921, Mr. Gleason was dispatcher, chief dispatcher, division superintendent and special assistant to the general manager on the Chesapeake & Ohio, being appointed superintendent of telegraph in February, 1921, in which capacity he served up until the time of his death.

J. Emmett Murphy, auditor of the Lake Erie & Pittsburgh and special representative of the general auditor of the New York Central, with headquarters at Cleveland, Ohio, died at his home in that city on March 18.

Henry H. Wilson, assistant to the mechanical superintendent of the Boston & Maine, with headquarters at Boston, Mass., died suddenly on March 7 in a hospital at Concord, N. H. Mr. Wilson was 64 years of age.

Judge R. M. Barton, formerly chairman of the Railway Labor Board, died in a hospital at Tampa, Fla., on April 5 after a long illness. Judge Barton was born in Greenville, Tenn., on November 26, 1851, and was educated at the University of Virginia. He was admitted to the bar in 1874 and practiced law in Chattanooga, Tenn. He served as United States commissioner, alderman of Chattanooga, as a member of the Tennessee Senate, judge in the court of Chancery Appeals, and later in the court of Civil Appeals. From 1920 until 1924 he was a member of the United States Railway Labor Board, and was elected chairman on April 17, 1920.

John P. Burrus, superintendent of the Houston Belt & Terminal Railroad, with headquarters at Houston, Tex., died at Kerrville, Tex., on April 6 following a protracted illness.

Howel Jones, land commissioner of the Santa Fe Pacific Railroad Company, the corporation in which is vested the land grant rights of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., died at his home in that city on April 7. Mr. Jones was born at Aberwystryth, Wales, on April 18, 1844, and first settled in the United States at Pittsburgh, Pa. He came to Topeka in 1872. Mr. Jones had been land commissioner of the Santa Fe Pacific since March, 1901, and in addition he had been a director of the Atchison, Topeka & Santa Fe from that date until his death.

TWENTY-FIVE CASH PRIZES ranging from $50 to $3 each, will be awarded amateur photographers who submit the best accident prevention prints in a country-wide contest conducted by the National Safety Council, Chicago.